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The Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test: Predictive validity in relation to academic school achievement of early grade level boys and girls

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THE PRESCHOOL LANGUAGE - COGNITIVE SKILLS ASSESSMENT FOR CURRICULUM ENTRY TEST: PREDICTIVE VALIDITY IN RELATION TO ACADEMIC SCHOOL ACHIEVEMENT OF EARLY GRADE LEVEL BOYS AND GIRLS

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Abstract of the Dissertation

Purpose: The purpose of this study was to investigate the validity of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test (PLACE) in predicting academic school achievement in the early school grades; 1, 2, 3, and 4.

Procedure: The primary relationship which was important to this study was the relationship between scores attained on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and subsequent academic achievement in the early school grades; 1, 2, 3, and 4. This relationship was investigated through a comparison of scores attained on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and subsequent academic achievement test scores obtained through the early school grades in the areas of reading, language, and math.

The sample population for this study was comprised of 146 early grade pupils who were located throughout nine school districts in two counties in Northern California. Identification information was compiled on each subject who was included in this study. Information regarding name, age, sex, case number, program, location, and grade level were included. Assessment information regarding the subjects' score on PLACE and subsequent early school achievement scores in the areas of reading, language, and math was entered on a computer code sheet according to the pupil's case number.

The data gathered on individual subjects facilitated the study of the relationship of each related factor to the primary question being investigated. The effect of age, gender, and preschool program of each subject was explored through statistical analysis using the Pearson Product Moment Coefficient of Correlation procedure. The relationship of early academic school achievement in the areas of reading, language, and math to scores attained on PLACE was explored in detail.

Results: The results of this study indicated that a significant positive relationship exists between scores attained on PLACE and subsequent scores attained on early school academic achievement tests in the areas of reading, language, and math. The data collected support the conclusion that scores attained on PLACE predict early academic school achievement in reading, language, and math. The relationship between scores attained on PLACE and early academic achievement in reading, language, and math was significantly positive for 3 year olds, 4 year olds, and 5 year olds. The establishment of these positive relationships indicates that assessment in preschool can successfully predict early academic achievement in grades 1, 2, 3, and 4. The findings pertaining to the relationship between grade level, scores attained on PLACE and early academic school achievement indicated that as children progressed in their early school grade, the relationship between PLACE scores and academic achievement increased. A statistically significant relationship was found to exist between sex of the participants, scores attained on PLACE and early academic school achievement. A statistically significant relationship was found to exist between the preschool program in which the child participated, scores attained on PLACE and early academic school achievement in reading, language, and math. This relationship was significant for both compensatory and general preschool children through the early academic grades 1, 2, and 3.

Recommendations: Further research is suggested in a number of areas relating to the relationship between PLACE scores and early academic school achievement. These include: (1) studies investigating the usefulness and applicability of PLACE in preschool programs, (2) studies investigating the applicability of PLACE in kindergarten educational programs, (3) studies investigating the relationship between PLACE scores and instructional objectives.

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

Shortly after World War II American educators turned their focus to a new area of concern, early childhood education. Educating the young child became a target of interest and development. At this time began three active decades of educational experimentation. While many curricula and creative programs emerged, sparse documentation was gathered. Assessment and evaluation procedures were scarce and little data were available in the first two decades of this period (Hodges, 1978). Little unity existed in program structure, philosophy or technique (Evans, 1971).

Early childhood education was heavily influenced as America grew more aware of social needs and specifically the needs of minority or disadvantaged populations. With an amendment to the Economic Opportunity Act of 1964, the Head Start Program was born. As programs were created out of this governmental funding source, a new direction in the field of early childhood education was clearly discernible. Compensatory issues became important among the philosophies in general early childhood education. The federal government joined private citizens, parents, schools, businesses, churches, and institutions in the funding and defining of preschool functions. While the government had been involved in the funding issues before, the impact this legislation brought could not be compared with past minimal contributions (Hymes, 1968). With this funding system and the growing availability of programs, accountability

and documentation became more important. Program effectiveness and student growth were targeted as increasingly important issues (Walker, 1973).

In 1975 with the passage of Public Law 94-142, early childhood education was once again strongly influenced by legislation and governmental funding. The needs of handicapped individuals and free and appropriate educational programs to serve them became a mandate for educators. The public schools were required to meet the needs of children as young as three years of age. Early evaluation and assessment of pupils became a requirement for educators, where state law permitted. As Kirk (1972) and Cruickshank (1967) found, between five and 40 percent of school age children of average intelligence demonstrate a developmental lag or handicapping condition which will influence their learning behavior. This broad range indicated the varied opinions regarding definition and identification of learning disorders.

While private and public funding sources and legislative requirements have been defined, program structure and organization in the preschool are not yet well clarified. Many directions can be seen as a reflection of special interest or sponsorship (Lofgren, 1978). Programs range from cooperative parent operations to formalized preschool instructional programs. Philosophies are varied and include emphasis on emotional training, social training, day care, custodial services, language training, and compensatory programs (Evans, 1977). A variety of terms can be identified in the service of the young child, ages two to six years. Parent and Child Centers, Child Development Centers, Day Care Centers, Nursery Schools, and Preschools are often labels which indicate a day program with emphasis on the care and development of the young (Hymes,

1968). With the greater emphasis on program and pupil evaluation since the mid-sixties, the need for pupil assessment methods which accommodate program goals include both cognitive and affective, socioemotional, aspects. The instruments with which to appropriately evaluate these areas have been difficult to locate and apply.

In response to the myriad of activity and diversity in the field of early childhood education, in 1974 the Minnesota Round Table Discussion was convened at the University of Minnesota to assess and evaluate the national direction of the discipline. Kilmer (1974) described the purpose of this discussion in terms of assessing the field of early childhood education and arriving at a new and nationally unified purpose. She identified the 1960s as a time of creation with unrealistic expectations. The panel called for the 1970s to be the decade for research and evaluation. Evaluation and reflection were paramount as the successors to the program construction emphasis of the 1960s. Hodges and Sheehan (1978) concurred when they reviewed research conducted in the post Head Start era. They stated concern regarding the sparsity of documentation and evaluation of child development programs on individual pupil progress. They concluded that no consistent picture of success could be drawn from the work of the 1960s. Documentation and evaluation procedures needed to be developed if the more effective approaches and programs were to be identified.

As preschool programs have continued to grow, two types of programs continue. Head Start programs reflect the compensatory philosophy while general preschool programs adopt individual philosophical foundations. As in

the program construction decade between 1955 and 1965, many different types of programs can be studied, but as the preschool movement progresses, professionals appear to agree that accountability and structure are now important. Early identification of the diverse learning strengths and needs of children is important (Lavatelli, 1968; Weber, 1970; Hodges, 1974). As mandated in PL 94-142, cited as the Equal Education Opportunity Act of 1975, early identification of handicapping conditions is the responsibility of the public school systems. Legislation and accountability as well as effective use of program dollars have compelled these programs to incorporate assessment procedures for the evaluation of program participants.

Assessment at the early childhood level of education is as varied as assessment at any educational level (Anderson and Messick, 1974; Hein, 1975). As Dawe demonstrated in 1934, observational measurement is a rich and valuable method in defining behavior and developmental patterns. Direct observation as a method of evaluation was widely used in the first half of this century. Hutt and Hutt (1970) found that this method waned in popularity between 1940 and 1960, and by the end of the 1960s the method again began to enjoy prominence in early childhood education. Common areas of assessment and observation of young children include socioemotional, language, creativity, intelligence, psychomotor, and cognition skills. Following the work of Bloom (1956) in his development of the taxonomy for cognitive development, assessment instruments began to emphasize measurement of specific elements or levels rather than merely recording the behavior of children. With the entrance of government funded programs in the 1960s, the requirements for assessment began to focus on the recording and evaluation of measurable and quantitative

data which would evaluate program effectiveness and document student growth.

Formal assessment procedures currently focus on several target topics which include intelligence, school-related skills, developmental skills, language, creativity, psychomotor development, and affective development. While the intelligence test focuses on predicting the success of individuals on general school related tasks, the other areas of testing focus more on skills or skill mastery than on predicting future academic success. Little has been available for use by instructional or paraprofessional personnel which yields standardized information regarding a variety of the areas with the validity to predict academic success (McCall, 1972; Anastasi, 1976). The predictive value of early childhood school related, multidimensional instruments which can be administered by instructional personnel is lacking (Goodwin and Driscoll, 1980). Thus, while an instrument may yield information regarding current levels of development, short-term application is the only value. For appropriate educational planning and intervention, standardized, predictive measurements must be incorporated in the early childhood educational assessment program.

Rationale for the Study

Early childhood education is currently a large and stable field of discipline. Snapper (1975) reported that even with the decline in population of three to five year olds from 1965 to 1975, there was an annual increase in the number of these children in preschool educational programs. Compensatory programs and programs to serve the handicapped have increased as legislation has positively influenced fiscal issues.

The last three decades have seen rapid growth in the development and delivery of early childhood educational programs. The convergence of a number of sociopolitical issues has intensified the significance of this period of growth. With the launching of Sputnik in 1957 public demand for improved education was evident. The growing unrest in American cities in the early sixties served to bring action to counterbalance the issues of poverty and disadvantaged children (National Advisory Commission on Civil Disorders, 1968). The war on poverty gave impetus in the mid-sixties to the creation of Head Start and other compensatory programs to equalize students' experience at school entrance. At the same time the rising divorce rate changed the complexion of the family. Greater numbers of women entered the work force, increasing the need for child care.

In the academic forum this period witnessed an active interest in the investigation of intellectual development and school effectiveness at the early childhood level. Bruner (1960) saw the early childhood educational experience as an important event in the development of the child's intellect. Hunt (1961) viewed the educational environment as fundamental in the development of intellectual maturation and diversity. Bloom (1964) presented the view that the early years were critical in the development of intelligence in as much as general growth is accelerated during this period. Clarke and Clarke (1976) questioned this belief when they challenged the concept that early learning is more critical developmentally than later experience. Weikart (1977) found a positive relationship between preschool education and positive academic success. Moore and Moore (1975) disputed the credibility of preschool education and supported home as the best environment for early learning

experiences. While little agreement has been reached regarding the appropriate type of early childhood training, the above researchers appear to agree that formalized training is important during this developmental time. Assessment and instructional diagnosis may enhance training endeavors.

Standardized assessment procedures in the preschool programs are a new concept. Within the last 15 years development has focused on the creation of instruments which can be given by instructional personnel with the aid of parent report of developmental history. Assessment of cognitive development is now beginning to emerge. Prior assessments have targeted physical development, motor integration, and perceptual skills. Language assessment has also long been recognized as the major source of information regarding scholastic readiness. However, little has been available for diagnostic use by instructional personnel which yields standardized information regarding cognitive as well as language functioning.

Assessment by instructional and paraprofessional personnel offers the broadest potential for comprehensive early evaluation. Instruments currently being used by these educators for preschool student assessment often reflect an informal or criterion referenced structure which does not facilitate normative comparison or predictive evaluation. Most comprehensive standardized instruments which assess preschool cognitive and language skills, require administration by a specialist or psychometrist or offer little documented predictive potential. Program adaptation, individualized teaching, and application of assessment information is likely to diminish when instructional and paraprofessional personnel are excluded in these assessment procedures.

Assessment at the early childhood level is important. Psychometric measures offer some of the valuable information needed to effectively plan intervention and special programs but cannot be used adequately to provide the information necessary for instructional diagnosis. Availability of staff and time limit the comprehensive applicability of intelligence and other psychometric instruments for instructional purposes. Gray and Miller (1967), Deutsch (1967), Hildebrand (1976), and Ehrlich (1978) recognize the importance of assessment in the early childhood programs. The concern over misuse of intelligence tests as single indicators of ability has emphasized the importance of the multiple assessment procedure (Gowan, 1967; Storlie and others, 1978). Goodwin and Driscoll, (1980) and Shwedel (1980) argue the need for predictively valid non-psychometric instruments at the early childhood level.

A review of instructionally related diagnostic instruments for use with preschool and kindergarten children shows reliable but poorly validated tests. While these instruments will be more closely examined in Chapter II, a brief review is presented here. Of the six norm referenced assessment instruments examined, the Boehm Test of Basic Skills and the Comprehensive Test of Basic Skills dismissed the issue of predictive validity as being inappropriate for the purpose and application of an achievement test (Boehm, 1971: Comprehensive Tests of Basic Skills, Technical Bulletin No. 1, 1974). The Stanford Early School Achievement Test did not present any information regarding the validity of the test (Goodwin and Driscoll, 1980). The Circus and the Metropolitan Readiness Tests do present information regarding predictive validity (Circus Manual and Technical Report, 1976; Metropolitan Readiness Test, Teacher's Manual, 1976). Each of these two instruments investigated the predictive

validity of the test by comparing student scores in the fall with their scores the following spring on equivalent forms or similar tests. While acceptable correlations were presented, no information was given regarding longitudinal studies or follow-up data. The California Achievement Test presents content and concurrent validity but does not address predictive validity (California Achievement Tests, Technical Bulletin No. 1, 1979). While these tests appear to be widely used in the field of early childhood education, they present minimal information regarding general validity and less information on predictive validity.

When instruments being used do not offer predictive validity, the comprehensive assessment offers only immediate significance. The availability of a predictively valid assessment instrument, which could be administered by instructional and paraprofessional personnel, would offer economical and readily obtainable information that could be used through all primary school years to individualize instruction and maximize educational experiences in the early grades. Program effectiveness, academic growth, assessment procedures, and school budgets might all benefit from the use of such an instrument.

The development of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test (PLACE) (Lofgren, 1978) originated from the need for an assessment instrument which would evaluate individual language and cognitive skill development of preschool age children, three to six years old. Initial construction focused on development of a criterion referenced instrument to be used by teachers and paraprofessionals in preschool educational programs. Further studies of the instrument, which will be discussed in Chapter III, focused on normative validity.

Test construction of the PLACE focused on organization of a comprehensive skill matrix which reflected normal developmental progression of language and cognitive skills between the ages of two years and seven years. These skills were selected from the work of researchers in the field whose instruments assessed language and cognitive skills at these age levels. Selection of appropriate instruments for study was made after investigation of the Headstart Tests Collection, Buros' Tests in Print, Doctoral Dissertation Abstracts, and commonly used tests listed in Calvin and Zaffiro (1974), Frost and Kissinger (1976), and Jordan, Hayden, Karnes, and Wood (1977), and Lofgren (1978). Forty instruments were studied for developmental organization. The final matrix, which was comprised of eight divisions, was formulated after consulting the consensus of experts as presented in Developmental Guidelines, Compiled from Selected Sources (Karnes, undated).

The PLACE test includes 114 items. Each item was constructed to reflect developmental properties being assessed. Visual and auditory processing, labelling, concept formation, classification, and verbal expression are some areas assessed in the increasingly difficult hierarchy of items. In preparation of each item the comprehension of the language by the child and the best presentation mode through which each item could be presented were carefully considered. The test was developed for use by instructional personnel to diagnose and assess instruction related skill mastery.

Lofgren (1978), in a study using the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test (PLACE) found the need for an instrument which could be administered by instructional personnel and which

would yield predictive information to facilitate individualized instruction. Recommendations of that study suggested a predictive validity investigation of this instrument to further enhance identification and assessment profiles of preschool children throughout the early grades (Lofgren, 1978).

Statement of the Problem

The Problem

It was the purpose of this study to investigate the predictive validity of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test for academic school achievement in the early school grades; 1, 2, 3, and 4.

This study sought to answer one major question:

What is the relationship between scores attained by preschool children on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and subsequent early academic school achievement?

Seven subquestions were investigated in this study:

1. What is the relationship between scores attained on PLACE by three year old subjects and their subsequent early academic school achievement?
2. What is the relationship between scores attained on PLACE by four year old subjects and their subsequent early academic school achievement?
3. What is the relationship between scores attained on PLACE by five year old subjects and their subsequent early academic school achievement?
4. What is the relationship between scores attained on PLACE by male subjects and their subsequent early academic school achievement?

5. What is the relationship between scores attained on PLACE by female subjects and their subsequent early academic school achievement?

6. What is the relationship between scores attained on PLACE by compensatory preschool subjects and their subsequent early academic school achievement?

7. What is the relationship between scores attained on PLACE by general preschool subjects and their subsequent early academic school achievement?

Significance of the Study

Since the late 1800s early childhood education and preschool programs in America have grown in their sophistication. The 1980s see the trend toward structure, accountability and academic preparation. While divergent philosophies are still present, professionals appear to agree that the preschool is a readiness setting with the task of training primary school behaviors. Preacademic training is a common thread represented in current literature.

Educational experience and research strongly suggest that individualized instruction produces the best learning results (Haring, 1968; Lovitt, 1970; Frostig and Maslow, 1973). As legislation mandates the early identification of handicapping conditions, assessment and individual learning profiles become increasingly important at the preschool level. A standardized and predictively valid assessment of language and cognitive skills in the preschool child could enable educators to plan effectively for the child's education throughout the early school years.

The need for standardized and predictive data on individual children at school entrance is a necessity if individualized instruction is to be a reality. Handicapped, disadvantaged, and general pupils can no longer be instructionally diagnosed only by environment or socioeconomic factors. Each child must be assessed on the basis of a clearly defined method of evaluating learning strengths and weaknesses.

An investigation of current preschool instruction related diagnostic instruments for use by teaching personnel reveals moderate predictive value (McCall and others, 1972; Walker, 1973; Anastasi, 1976). While several of the instruments surveyed presented construct and content validity data, predictive validity issues are rarely addressed. There exists a clear need for a predictively valid instrument for use by instructional personnel to assess preschool academic, cognitive, and language functioning. This study may have significant impact on the assessment procedures of preschool pupils.

Assumptions and Limitations to the Study

For the purpose of this study the following assumptions and limitations are set forth:

Assumptions

1. A standardized diagnostic instrument with predictive validity will be of immediate use to instructional and paraprofessional personnel in preschool education facilities.

2. Language and cognitive development promote academic success in the early school grades.

3. Subjects located after 5 years, adequately represent the target population.

Limitations

1. The biological and psychological maturation of subjects, instructional and program methods, or teacher intervention over time may confound the findings of this longitudinal study.

2. The diversified localities and uniqueness of the counties and school districts involved may confound the findings of this longitudinal study.

Definition of Terms

Academic Achievement:	Progressive growth patterns in the development of cognitive mastery in the areas of reading, math, and language.
Cognitive:	Modes of thought, knowing, and symbolic representation, including comprehension, judgment, memory, imagining, and reasoning (Sattler, 1982).
Compensatory Preschool Program:	An early childhood education program designed to serve disadvantaged children through the identification, diagnosis, and remediation of environmental and cognitive retardation (Deutsch, 1967).
Early Childhood Education:	The area of education which focuses on the development and training of young children from infancy to eight years of age (Weber, 1970).
Early Grades:	Elementary school grades which include first, second, third, and fourth.
General Preschool Program:	An early childhood education program which includes children in general, may be funded privately or publicly, and serves children ages two to six years of age.

Head Start Preschool: A compensatory preschool program which is publically funded and serves disadvantaged youngsters from three through five years of age (Hymes, 1968).

Language: A vocal or graphic symbolic formulation of ideas or feelings for the purpose of communication through the use of semantic or grammatic structure (Nicolasi, Harryman, and Kresheck, 1983).

Nursery School Program: A general preschool program which is privately funded, is offered as a half day program, is generally partially staffed by unpaid parent assistants, and serves children in general from two through four years of age (Hymes, 1968).

Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test: An assessment instrument which measures cognitive and language development of children ages 3-0 to 5-11 on the basis of remembering, reasoning, problem solving, and concept formation. Administration by a psychologist is not required.

Standard Scores: Scores attained on normative instruments through individual or group testing which represent the individual's distance from the mean in terms of the standard deviation of the distribution (Anastasi, 1976).

Summary

Early childhood education is a large and diverse field. The last twenty years have seen an abundance of experimentation and investigation regarding programs and techniques in the early childhood forum. Sociopolitical and legislative issues have given impetus to this dynamic movement. Government funding for compensatory programs has emphasized the need for accountability

and documentation of program effectiveness and student growth. Assessment instruments and procedures to facilitate instruction and identify individual student needs have become increasingly important. This study's purpose was to investigate the relationship between a preschool assessment instrument, Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test, and early academic school achievement. The research question focused upon the relationship between scores attained on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and subsequent early academic school achievement in the areas of reading, language, and math. Defining the predictive relationship may be helpful in longitudinal planning for the early learner.

CHAPTER II

REVIEW OF THE LITERATURE AND RESEARCH

Chapter II examines the areas of material pertinent to this research study. The purpose of this study was to investigate the validity of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test in predicting academic school achievement in the early school grades. A review of the literature and research is presented to substantiate the importance of this study. One part of the review is a contemporary overview of the study of language development and acquisition. Following is an indepth look at the research pertinent to assessment of language and cognitive development in disadvantaged preschool children which represents major experimental programs as well as comparative studies. A review of selected assessment instruments which emphasize measurement of language and cognitive behaviors in preschool programs is included as well.

Language Skill Development

The acquisition and development of language is one of the most distinctive and phenomenal aspects of human growth. Since the time of the ancient Greeks language development has been the subject of philosophical speculation. Today the study and assessment of language has achieved the status of an autonomous academic discipline with numerous research orientations. During the first half of this century there were two major thrusts in the investigation

and assessment of language development (Bloom, 1975). Research and assessment data were compiled through the use of individual observational studies of children or through the use of large-scale studies which included a variety of ages and a diversity of social classes. The diary studies of Ronjat and Leopold (1939) presented a linguistic record of bilingual development. McCarthy (1954) reported that other research endeavors of this period included the normative studies which focused on large numbers of children who represented a wide variety of ages, social classes, sex, and birth order (McCarthy, 1954).

In the 1950s researchers began to be concerned with different types of information with regard to language development. The assessment focus shifted from recording data on the form of language to recording data on the structural knowledge of language. The investigation and assessment of child grammar revealed an underlying knowledge of language. This was described in 1957 by Chomsky when he presented the theory of transformational grammar. The major concept of this approach stated the hereditary knowledge of language to be equal to a series of established patterns. Through a knowledge of the basic transformations of the language, the child matures and creates new combinations of communication. McNeill (1970) saw evidence of an inherent grammatical structure in his observations that "from the first moment of speech, children have the ability to communicate grammatical relations in a manner understandable to adults" (p. 70). Whorf's hypothesis, however, proposed that language was a cultural experience which influenced perceptions of the universe as well as the thought process itself (Whorf, 1956).

In 1964 the study of Ervin and Miller summarized the psycholinguistic approach to language research and assessment. Consistent with the findings of Brown (1973), they found that children in their language maturation, do not learn all words, sounds, or sentences possible in a given language. Instead, they concluded, language development is the result of patterned knowledge of the linguistic system. As McNeill (1970) suggested, "Children's speech . . . makes use of prediction and prediction is a fundamental aspect of the deep structure of sentences" (p. 1089). Through the process of grammatic closure the child processes and produces language rapidly and at times automatically.

During the middle 1960s another important shift in the research took place. The emphasis turned from a description of language to an exploration and assessment of early language development. The focus was directed toward the cognitive process in language acquisition. A review of the research indicates a diversity of investigative approaches and assessment procedures. The research of Bereiter and Engelmann (1966) was concerned with the performance of culturally disadvantaged children in relation to language development and school achievement. In 1971 Semmell and Dolley determined that the order of language acquisition to develop in a fixed pattern across a wide range of IQ scores. While the rate of acquisition varied greatly, the order of rule acquisition was very similar in all cases. Brown (1973), however, criticized this hierarchy theory. Bloom (1975) directed attention to defining the process of early language and cognitive development. In an effort to clarify the relationship between cognition and language development, researchers studied the cognitive and intellectual growth of general, culturally, and economically disadvantaged preschool children. Assessment and prescriptive programs were developed to evaluate and serve these young children.

Assessment and the Language and Cognitive Skill Development of the Disadvantaged Preschool Child

Without exception assessment studies of 3 to 5 year old children of disadvantaged backgrounds show them to be retarded or below average in intellectual abilities (Coleman and Ward, 1955; Sattler, 1982). Although this finding is not always at the statistically significant level, the difference between privileged children and children of disadvantaged backgrounds is measurably evident in favor of the first group. As Bereiter and Engelmann found in 1966, a disadvantaged child generally tests from five to 15 points below average for his given age. Preschool disadvantaged children are usually at least one year behind their peers when they enter educational programs. Vocabulary size, sentence length and grammatical structure all show inferior development. Reasoning ability and logic development also lag one year or more behind average development. Since verbal and reasoning ability have been found to be major factors in school achievement, children from disadvantaged backgrounds are deficient in the areas which are most significant (Jensen, 1966).

If one considers that IQ scores indicate knowledge which has been acquired rather than ability to learn, one might predict greater success for the disadvantaged child as he progresses through school. Research indicates this is not the case. In his study of middle and lower class children at the first grade and fifth grade level, Deutsch (1965) found the diversity of performance broadened in favor of middle class children as the grade level increased. The deficit with which the disadvantaged child entered school continued to grow as his school experience advanced. The drop-out population at the secondary level is largely

comprised of disadvantaged students, and those disadvantaged students who do complete high school are measurably below the average level of achievement (Kagan and Zahn, 1975).

Since the early 1960s, there has been a movement in education to attempt to offset the well-documented intellectual deficits of disadvantaged children entering first grade by providing various types of early assessment and education. The most common approach has been to provide "enrichment" which the disadvantaged home has been unable to provide. Operation Head Start was based on this rationale. Preliminary results of this type of preschool program were disappointing. Disadvantaged children still entered first grade at a deficit which became greater as they proceeded through school (Bereiter and Engelmann, 1966). However, recent data substantiate the significant positive longitudinal effects of enrichment programs (Lazar, et al., 1978; Schweinhart and Weikart, 1980).

It was reported that after reviewing the initial data from early "enrichment" programs presented below, it became evident that attention had to shift to the assessment and training of specific aspects of the cognitive process and language development in preference to providing only "enrichment" (Almy, 1966; Kamii and Radin, 1967; Elkind, 1969). The general preschool children were not going to wait for the disadvantaged to catch up. It was unlikely that a middle-class child's experiences over a great deal of time could be compressed into a preschool program and assimilated by a disadvantaged child. Bereiter and Engelmann reported in 1966, "The basic fallacy behind the enrichment strategy is the idea that since privileged children learn what they

do from certain experiences, disadvantaged children must learn from the same kinds of experiences" (p. 9).

Assessment and Preschool Experimental Programs

Assessment procedures in the preschool experimental programs presented below focused on the evaluation of general intellectual ability and growth of the subjects. While the structure of these programs focused on specific academic skill instruction, the assessment components focused on assessment of general intellectual growth. The reliability and validity of the IQ tests may have contributed to the research design of the experiments but may not have been appropriate in evaluating the longitudinal importance of the programs or their predictive value regarding future academic achievement. The use of predictively-valid, instructionally-related assessment instruments might have enhanced these programs. To facilitate appropriate educational planning, intervention and evaluation predictive, standardized instructionally-related measurements can enrich preschool programs and longitudinal academic planning throughout the early school years.

One alternative to the traditional enrichment program was the Perry Preschool Project which was begun in 1962 as a long term effort to assist disadvantaged black children. The program (Weikart, 1967) took the work of Piaget as its theoretical framework and was "designed to enable children to produce meaningful mental representations and to derive relationships among objects and events, both real and represented" (p. 8). The language training portion of the four-part curriculum was based on the assumption that the child had already learned the basic language structures and that the preschool would

create an environment that would induce the child to organize his language into a conceptual tool.

After two years in the program, assessment showed that experimental group children, who had entered the training program at age three or four, made significant IQ score gains when compared to control group children who did not attend preschool. At the end of second grade, however, significant IQ differences were not measurable. However, achievement tests and teacher ratings of academic motivation for the experimental groups continued to be higher after three years in public schools (Weikart, 1977). After nine years in the public schools, achievement scores were still higher for experimental groups. Stevens (1981) found "at age 14, there were significant differences in favor of those in experimental groups in reading, vocabulary, math concepts/ problems, and language and spelling, although not in reading comprehension" (p. 57). Early assessment which evaluated intellectual growth of participants in this preschool program may have contributed to initial evaluation of the effectiveness of the program. However, subsequent follow-up assessment in the early and middle school grades which focused on evaluation of instructionally-related academic skills as well as general intellectual ability demonstrated the longitudinal value of the program in influencing the academic success of experimental group children.

The Early Training Project designed by Gray and Klaus in 1962 (Gray, 1966) was also carried out with disadvantaged black children. The assessment and educational intervention were designed to combat the progressive retardation of children reared in deprived circumstances who entered school with an initial

disadvantage and fell further behind. Their intervention method took the form of two or three intensive summer preschools plus one or two years of home visitation and parent training when the preschool was not in session. The two major emphases of the curriculum were remediation of linguistic and conceptual deficiencies and development of attitudes thought to promote success in school.

At the conclusion of their participation in the program, experimental group children made significant gains over control groups on IQ tests, the Peabody Picture Vocabulary Test, and the Illinois Test of Psycholinguistic Abilities. The emphasis on instructionally-related assessment instruments as well as general IQ tests may have contributed to the academic programming and success of experimental children. The significance was maintained through the fourth grade on IQ and on measures of language and achievement. After the end of fourth grade there was no longer a significant difference. Gray (1966) found all of the groups, control and experimental, had declined in comparison with more advantaged children, suggesting, perhaps, that "the home and school environments were presumably not adequate to prevent some decline" (p. 53). Between 1975 and 1980 follow-up data were collected regarding experimental and control subjects. No significant differences were found between experimental group boys and girls as compared with control group boys and girls in the areas of IQ, reading, English, or math achievement (Stevens, 1982). Female experimental participants displayed better attitudes, social adaptation, and life coping skills than did other girls and boys in the control and general populations (Gray, Ramsey, and Klaus, 1982). While the general longitudinal effects of this program were not as strong as those of the Perry Preschool Project, the program may have had lasting influence on black girls.

A preschool language training program that has had great impact as an alternative to traditional enrichment programs is one developed in 1966 by Bereiter and Engelmann which used intelligence and academic achievement assessments. This program was highly structured and has been used in many comparative studies. It was based on the premise that the disadvantaged child had no prior mastery of English. They believed disadvantaged children had failed "to master the cognitive uses of language, which are the uses that are of primary importance in school" (p. 42). The assessment and instructional program addressed two specific weaknesses of language development, single word sentences and structural word mastery. The basic teaching method was the repetitive pattern drill.

Three groups of children in this program for two years had Stanford-Binet Intelligence Scale IQ score gains from 10 to 25 points at the conclusion of their instruction in the program. On instructionally-related assessments of reading level these children scored at or above grade level by the end of kindergarten (Osborn, 1968). The immediate intellectual gains reported substantiated the importance of structural programming for imitation and reinforcement in language acquisition.

A fourth experimental program, which used instructionally related assessment procedures, Talk Reform, developed in England by Gahagan and Gahagan in 1970, was based on Basil Bernstein's idea that differences in language usage do not arise from lack of syntactic understanding but from cultural constraints (Gahagan and Gahagan, 1970). Talk Reform emphasized structuring situations so that certain types of thinking would be required and

children were expected to verbalize their thinking. For three years, children were trained in activities designed to improve attention and auditory discrimination, explicit language usage, and language structure and vocabulary. As Cazden observed in 1972, this program had "initially promising results (and) shows what can be done in a uniquely English way to enhance the development and use of language in school" (p. 20).

Assessment and Comparative Studies of Preschool Programs

In 1968, Dickie conducted a study to ascertain whether structured preschool programs were more effective in language training than traditional, unstructured enrichment programs. General intellectual ability and receptive vocabulary skills were assessed in this program. All children in the experimental group attended preschool for 2 and 1/4 hours sessions daily; language training took place for a 20-minute period.

The children were pretested on the Stanford-Binet Intelligence Scale and the Peabody Picture Vocabulary Test. After six weeks in the program, Dickie (1968) reported no significant differences were found, although "in nine of the 11 comparisons made between the treatment groups . . . the structured group had higher means than the unstructured group" (p. 73).

Another study which made comparisons between preschool programs on the basis of structure and teacher-pupil ratio was reported by Karnes in 1970. On the basis of an earlier study by Karnes and Teska in 1968, they concluded that highly-structured programs were recommended, though the gains made required the test of time (Karnes and Teska, 1968). In this study, she randomly assigned

60 disadvantaged children to one of four structured experimental program groups. The first two programs, Montessori and Karnes Ameliorative, emphasized cognitive development. The third program, Bereiter-Engelmann, focused on skill patterning, and the fourth, Traditional Preschool, on enrichment. The children went to preschool approximately 2 and 1/4 hours a day for eight months.

Based on a comparison of pre- and post-test data on the Stanford-Binet Intelligence Test, Illinois Test of Psycholinguistic Abilities, and the Peabody Picture Vocabulary Test all four experimental groups made greater gains than the control group on intelligence test scores. The groups which reflected the smallest teacher-pupil ratio demonstrated the best performance on the psycholinguistic and receptive vocabulary measures (Karnes, 1970). Structured assessment and prescriptive instruction in this preschool program was reported to produce positive language and cognitive gains.

Another study focused on the effects of teacher style of speaking. Smothergill (1971) found that children, after exposure to either elaborative or non-elaborative teaching styles for 17 sessions of 20 minutes each, tended to use whatever style they were exposed to. The children exposed to the elaborative style gave better performances on verbal problem-solving tasks, but there were no significant differences on non-verbal problem-solving tasks (Smothergill, 1971).

Hart and Risley conducted an experiment with 11 black children in a preschool in which they attempted to teach the children to use compound

sentences with a technique of incidental teaching. Incidental teaching would take place during a child-initiated interaction between an adult and a single child. At the end of the school year, the children used more compound sentences addressed to both adults and children even with the withdrawal of all prompting, as assessed by instructionally-related observation (Hart and Risley, 1975).

In 1975, another comparative study was done by Miller and Dyer in which four preschool programs were compared both for immediate impact and for long term effects on cognitive, social, motivational, and perceptual development. The programs were selected on the basis that they represented extreme positions, showed evidence of success with the disadvantaged, provided ample information about goals and methods and trained teachers for program delivery. The four programs selected were Bereiter-Engelmann, Darcee (Demonstration and Research Center for Early Education), the Early Training Project of Gray and Klaus, Montessori, and Traditional (Project Head Start, OEO). All programs were based on an environmental deficit model. Bereiter-Engelmann and Darcee used didactic instruction in small groups, while Montessori and Traditional were child-centered and individualized. Bereiter-Engelmann and Darcee programs were both remedial and preparatory emphasizing immediate skill development, while Traditional and Montessori aimed for long term development, Montessori toward cognitive development and Traditional toward motivational and social development. Bereiter-Engelmann and Darcee shaped behavior with reinforcement, while Montessori was designed to make reinforcement unnecessary. Of 48 Head Start classes screened, the experimenters took 14 as a sample, using four each for Bereiter-

Englemann, Darceé, and Traditional and two for Montessori. The children went to preschool for one year, 6 and 1/2 hours a day.

The immediate effects, as measured after one year of preschool, seemed to favor Bereiter Engelmann and Darcee. All experimental groups had higher Stanford-Binet Intelligence Scale IQ scores than controls, with Bereiter Engelmann and Darcee superior to Montessori and Traditional. Darcee was highest at the eight weeks initial test, and Bereiter-Englemann and Traditional showed the greatest gains in IQ scores over the year of training (Miller and Dyer, 1975).

Later scores showed a decline in IQ scores for all groups with the sharpest drop for Bereiter-Engelmann. Darcee and Montessori had the higher IQ scores after three years. Miller and Dyer (1975) reported that while all experimental programs were at or above national norms on reading achievement scores at the beginning of first grade and were superior to the controls, by the end of the second grade, Montessori, Bereiter-Engelmann, and the control groups were superior to the other experimental groups with Montessori being the highest. Miller and Dyer (9175) stated, "Unfortunately, even the Montessori children were no longer achieving up to grade level" (p. 20).

In 1978, a comparative study was presented by the Consortium for Longitudinal Studies. This study compared the longitudinal effects of 11 preschool programs which had been delivered between 1962 and 1973. Among the autonomous programs included were those independently designed by Weikert, Gray, Karnes, Gordon, Beller, Leuenstein, and Miller. Children had

entered the programs between the ages of 2 and 5 years of age and had participated between one to three years in either a home based, center based, or combination program. In 1977 subjects were between nine and 19 years of age at the time of the follow-up study. Lazar (1978) reported that "early education significantly reduced the number of low-income children assigned to special education classes" (p. 6). He also found that preschool programs reduced the number of "grade failure" among low-income children. Achievement of minimum standards in school performance was more favorable for preschool children than for control children. No significant longitudinal differences between experimental and control subjects were found on IQ scores. While assessment and educational techniques varied among the projects studied, the positive longitudinal effects of preschool assessment and diagnostic instructional planning was clearly demonstrated.

The above studies indicate that the experimental assessment of the language and cognitive skill development of general and disadvantaged preschool children has focused primarly on the use of intelligence test data. Experimental, comparative, short-term, and longitudinal studies predominantly report IQ scores as evidence of program effectiveness and student progress. However, early findings regarding the longitudinal effectiveness of compensatory preschool programs were misleading when only IQ scores were evaluated (Bereiter and Engelmann, 1966; Gray and Miller, 1967). When academic achievement scores were also used to study longitudinal effectiveness of these programs, significantly positive evidence was presented regarding the efficacy of experimental preschool programs (Lazar, 1978). The early studies reviewed above primarily showed the use of IQ general ability tests to measure gains

made in specific instructional skill programs. Shipman (1976), Lazar (1978), and Gray, Ramsey, and Klaus (1982) support the importance of using comprehensive instructionally related achievement skills assessment when evaluating student progress over time.

Instructionally-Related Assessment Instruments for Preschool Children

During the first half of this century, techniques for the assessment of preschool children focused on informal observational methods. Preschool education, being a new area of development in the early 1900s, drew from a number of professional disciplines and unified people of diverse backgrounds (Weber, 1969). Arnold Gesell, a physician, conducted observational assessment research at Yale University to determine the normative steps in the development of young children. In 1912, he reported, "The primary child is in the expressive language period of development . . . give him large undemarcated spaces . . . so his expression may be full and free" (p. 81). Bird Baldwin at the University of Iowa also began a laboratory to enable him to observe and assess young children. Through the efforts of graduate students, logs were kept to record the ages and action of the children as they were led through a series of planned activities (Baldwin, 1922). Another program established by Harriet Johnson, a nurse, emphasized observational assessment of young children as they attempted a series of structured tasks (Johnson, 1928). Toward the end of this period, during the 1940s and 1950s, the focus shifted to the observation and recording of emotional and social development in the young child. Developing a sense of self and autonomy in the young child was the focus of teacher training during this time. The work of Freud and the writings of Dewey were very influential (Osborn, 1975).

During the 1960s a shift in assessment methods began to occur. The flight of Sputnik, the writings of Bruner and Hunt, and the research of Piaget started to influence educators. The Civil Rights thrust of this time created the Elementary and Secondary Education Act which provided millions of dollars for programs to serve the disadvantaged child. By July, 1965 there were 580,000 children enrolled in Head Start programs in 2,500 communities (Hymes, 1968). The need for assessment instruments which could evaluate the progress of these children and the success of these programs emerged. Since 1965 preschool education has become more comprehensive with increased requirements for instructional accountability and documentation of the effective use of governmental funding.

Instructionally-related diagnostic instruments for use with preschool and kindergarten children offer assessment of initial academic skills. This information is useful in determining the instructional grouping of children, curriculum selection, concept and skill mastery, individual instructional needs, student progress, and program effectiveness. Both criterion-referenced and norm-referenced measures are available for instructional diagnosis and planning. For the purpose of this study six frequently used norm-referenced tests are discussed. As Mercer (1979) notes these instruments "rank student performances compared with a normative population, and utilize standard scores" (p.90). Each instrument is reviewed regarding structure, norming procedures, reliability and validity. While all of the instruments present acceptable reliability, only two present information concerning predictive validity.

The Boehm Test of Basic Concepts was developed to assess children's mastery of concepts necessary for early grade academic achievement. The identification of individual children with special needs and a profile of classroom skills can also be accomplished with the Boehm. It was developed in 1971 for the purpose of assessing the skills of children in kindergarten through second grade, and remedial instructional suggestions are made based on concepts missed by the child. It can be administered to either large or small groups and requires children to mark or point to appropriate pictures in a workbook. This test consists of two parallel forms of two parts each. Raw scores are converted into percentile ranks.

Norms are presented for children from over 20 cities in the United States. Data were compiled from various socioeconomic levels for kindergarten, first, and second grade children. The test developer emphasizes that the test does not present national norms since it was primarily intended for screening and instructional planning. Prediction of future performance is not a purpose of the Boehm.

The Circus test, developed by Educational Testing Services in 1972, has two major purposes. The first is to diagnose the instructional needs of young children, and the second is to record and evaluate the effectiveness of educational programs which serve young children. The Circus is divided into two categories, Level A covering preschool and early kindergarten, and Level B covering late kindergarten and first grade. Although the tests are similar, Level B is somewhat advanced. Most measures on each test are answered by the children, but three at each level are completed by the teacher. Circus

includes preliminary practice materials to develop the child's test taking abilities. While the manual suggests student enjoyment of the test as an asset (Goodwin, 1978), group testing may be more difficult than presented in the manual due to the lack of test taking experience of the young preschool subjects (Ambron, 1978). Most of the measures are untimed tests given to small groups. The teacher reads each item aloud while the child marks the picture s/he chooses as the answer in an answer booklet.

Norming procedures of this test were comprehensive, sampling 2,000 kindergarten children and 1,000 nursery school children for Level A. Over 6,000 children were involved in norming Level B. Classrooms throughout the nation were randomly selected with careful attention given to sampling of sex, ethnicity, school experience, age, socioeconomic status, and regions of the country. Scoring procedures convert raw scores to percentile ranks, six month growth expectancies, and to sentence reports.

The California Achievement Test (CAT) is a comprehensive set of tests for the evaluation of educational skill mastery. Both norm-referenced and objectives based information can be derived. Achievement is measured in the areas of prereading, reading, spelling, language, mathematics, and reference skills. California Achievement Test Form C is a series of tests for assessment of kindergarten through twelfth grade students. It is intended for group administration by the classroom teacher over several hours and test sessions. Test items were developed from objectives related to instructional material. Items were reviewed for racial, ethnic and sex bias.

The normative sample was comprised of approximately 200,000 students from kindergarten through twelfth grades, 5,066 of whom were kindergartners. National samples were gathered throughout seven regions of the country. Socioeconomic balance was carefully maintained in the normative population. Scores are reported for each test level. Raw scores are converted to percentiles, grade levels, standard scores, and stanines. Information based on the standard error of measurement is presented for each grade and test level.

The Comprehensive Tests of Basic Skills (CTBS), Levels A and B developed in 1972, offer an extensive battery for the assessment of preschool and first grade children. While this test has been designed for group administration by the classroom teacher, it requires practice test sessions and suggests four separate test days for completion. Item content is designed primarily to assess language and reading skills. Level A yields three composite scores, Total Alphabet Skills, Total Visual and Auditory Discriminaton, and Total Prereading, as well as individual subtest scores. Level B yields four composite scores which include Total Reading, Total Language, Total Mathematics, and Total Battery in addition to individual subtest scores.

Norming procedures were complex and thorough and appear to represent the nation's schools. Following an extensive sampling, all school districts were categorized according to average enrollment per grade, geographic location, and community and school type, large city public, other public and catholic. Sample districts were then drawn and schools were randomly selected. Each individual school was investigated for size, neighborhood self description,

student characteristics, ethnic dispersion, and staff and materials characteristics. Over 16,000 students were sampled for Level A and over 13,000 students for Level B standardization. Scoring procedures allow the teacher to translate raw scores into percentile ranks, stanines, grade equivalents and expanded standard scores which unite all levels of the CTBS.

The Metropolitan Readiness Tests (MRT) have as their primary purpose the evaluation of student readiness for grade one instruction. The 1976 edition has two levels. Level I is for early to mid-kindergarten, and Level II is for late kindergarten and early first grade. Test content focuses on auditory, visual, and language areas on Level I, and auditory, visual, language and quantitative skill areas for Level II. A pretest is recommended to prepare children for the actual test which is given orally by the classroom teacher to the group. Children mark directly in a booklet to indicate their choice of a specific number or letter. Composite scores are computed for each skill area, as well as a prereading skills composite on tests one through six on both levels. Raw scores can be translated into stanines and for the prereading skill composites to percentile ranks.

Normative procedures were comprehensive and sampled more than 100,000 kindergarten and first graders. School districts were listed according to enrollment and socioeconomic criteria and were then chosen at random to participate in the national study. Small and large city public schools and parochial schools were included in the random sample. Sex, ethnicity, geographic location, and previous school experience were controlled to be representative of the national school population.

The Standard Early School Achievement Test (SESAT) developed in 1969, has as its purpose the evaluation of children's cognitive abilities during kindergarten and first grade. It is not intended to be a readiness test (Madden and Gardner, 1969). In content it is similar to the CTBS and the MRT. It requires multiple sessions for administration, is teacher administered, and is available in two levels. A practice test is recommended to prepare children for the testing experience. As Cazden notes, the test format may be difficult for some children because pictures are small and are crowded onto each page (Cazden, 1978). Level I content areas include environment, mathematics, letters and sounds, and aural comprehension. Level II tests include the environment, mathematics, letters and sounds, aural comprehension, word reading, and sentence reading. Raw scores can be translated into stanines and percentile ranks. Total scores can be obtained by adding individual test scores.

Large normative samples were used for standardization. For Level I, over 20,000 kindergartners and first graders were sampled. Over 7,000 first graders were sampled for Level II. National representation was achieved in regard to geographic location, population of city, and socioeconomic status.

Reliability of Instructionally-Related Assessment Instruments for Preschool Children

Acceptable reliability coefficients for the Boehm are presented. Split-half reliability coefficients for Forms A and B range from .81 to .90. The coefficients of stability between Form A and B with an interval of one day to less than one week were from .72 to .88 for all levels. The reliability of the test diminished for the child of higher socioeconomic status in the second

grade. Little variation of scores was seen because most of these children reached the maximum score possible.

Reliability of the Circus is presented regarding internal consistency of each test and subscale. Reliability coefficients are acceptable with a range of .60 to .90. Information is thoroughly presented on each item. No information is presented regarding the stability of the instrument.

The California Achievement Tests present test, retest reliability coefficients for the kindergarten sample which ranged from .17 on the numbered sentences subtest to .84 on the match letter forms subtest. Most of the coefficients showed a correlation in the .54 range with an interval of two to three weeks (California Achievement Tests, Technical Bulletin No. 2, 1980). With an interval of six months coefficients ranged from .48 on the letter names subtest to .76 on the total prereading subtest (California Achievement Test, Technical Bulletin No. 1, 1979). Internal consistency coefficients range from .73 on the mathematics subtest to .96 for the prereading subtest (California Achievement Test, Technical Bulletin No. 1, 1979). Inter-rater reliability data are not reported in the manuals.

Reliability of the Comprehensive Tests of Basic Skills was investigated mainly in the areas of internal consistency and standard errors of measurement. For Level A, separate test interval consistency coefficients range from .72 to .92. The most frequent coefficients were in the .89 range. For Level B, coefficients range from .62 to .91 with the most frequent being in the .79 range. For the composite scores some coefficients were reported in the .95

range. A comparison of student performance on Level A in the fall and Level B in the spring is presented to investigate stability. The question of equivalence is also investigated. Test-retest coefficients for most comparisons with a six month interval range from .40 to .78.

Reliability reports for the Metropolitan Readiness Tests focused on internal consistency and equivalence between forms. Internal consistency coefficients for the prereading composites on both levels were in the .90s. Skill area scores ranged from .68 to .93 with most scores in the .80s. Alternate form reliabilities were in the .80s for the composite prereading areas but were not as strong in the individual skill areas, ranging in the .60s and high .70s.

Split-half reliability coefficients are reported for the Stanford Early School Achievement Test on Level I with the median correlations of .79 for kindergartners and .82 for first graders. On Level II internal consistency reliability coefficients for individual tests for early, middle, and late first grade samples were .80, .90, and .90 respectively. Internal consistency reliabilities for the total score are .94, .97, and .97 respectively.

Predictive Validity of Instructionally-Related Assessment Instruments for Preschool Children

Validity information for the Boehm focuses exclusively on content. However, little information is presented in this area. Content validity relies on curriculum materials from which concepts were selected. Noll (1970) suggests that the curriculum materials used were not adequately described to support content validity. Criterion and construct validity were not addressed in the

manual. As noted before, predictive validity was not acknowledged as appropriate for this test. The test manual presents no information on predictive validity.

The Boehm Test of Basic Concepts is a reliable instrument for use with kindergarten and first grade. Use with second grade children becomes questionable when used with upper socioeconomic subjects. The Boehm offers quick group administration by the classroom teacher with instructional suggestions to remediate concept deficiencies. The availability of alternate forms is also positive. While norms are adequate to facilitate standardized assessment with acceptable reliability coefficients, validity is uncertain. The weak investigation of content validity and neglect of criterion, construct, and predictive issues presents inadequate technical data.

Content validity is not presented in the Circus manual. Concurrent validity was investigated by having teachers rank student skills which were compared with the student's performance on specific measures of the test. For Levels A and B average correlations were .41. A factor analysis of each level was computed regarding performance of Circus measures to investigate construct validity. A general ability factor was evident at each level which challenges the developer's attempt to avoid a global measure. Predictive validity is addressed through the examination of the fall scores on Level A of 1,000 kindergartners as compared to their spring scores on Level B. With an interval of six months, an average correlation of .57 was reported. While one might question the predictive value of this investigation, it clearly does demonstrate some stability and equivalence of test forms. While the validity

information presented enhances understanding of the instrument, it does not directly address the stated purposes of Circus (Goodwin, 1978).

Circus offers multiple measures which can be used in a variety of ways to meet individual teacher and classroom needs. Strong internal consistency reliability is presented. Norm sampling procedures are complete and detailed in the manual. Further investigation of predictive validity and stability would enhance the value of this instrument.

Validity studies of the California Achievement Text focused on content. The test developers consulted experts in the field who represented various ethnic groups. The language and content of each item developed by professional item writers were reviewed for "bias in language, subject matter, and the overall representation of people" (California Achievement Test, Technical Bulletin No. 1, p. 14). Appropriate items were then included in a structured "try-out" test in which items were administered to a sample in the grade level they were developed for as well as one grade level above and below the target grade level. Concurrent validity studies included comparisons between scores on the California Achievement Test Form C and a related test produced by the same developers, the Short Form Test of Academic Aptitude (SFTAA). However, these studies did not include the kindergarten tests. No predictive validity data were presented.

The California Achievement Tests present a well-organized system for the assessment of preschool children. Norming procedures were thorough and reflect a strong national and socioeconomic sample. Scoring information is

complete and useful. Reliability information neglects the inter-rater variance. Validity data addresses content but poorly investigates concurrent and predictive information.

Validity information for the Comprehensive Tests of Basic Skills focuses on content. Criterion validity is presented as inappropriate for an achievement test (Comprehensive Tests of Basic Skills, Technical Bulletin No. 1, 1974). Experts in the field of early education were consulted to evaluate needs in early testing batteries, including recommendations for revision and new materials required in the field. Following this investigation, actual test items were written by teachers and content area specialists. Following a tryout of test items, revisions and elimination of items were made after consideration of student performance on the item, the item's ability to differentiate students who performed well or poorly on the whole test, and the correlation of the item to total test performance. Test tryout procedures were conducted separately for white and black subjects to gather more data regarding bias. Qualifications of experts consulted were not thoroughly presented. Predictive validity, as mentioned before, was not investigated.

The Comprehensive Tests of Basic Skills, Levels A and B, presents an extensive battery for evaluation of the young learner. Thorough standardization data is presented. Reliability and content coverage is appropriate. While content validity is investigated, validity in general is lacking. Criterion-related validity is neglected, including any predictive investigation (Nitko, 1978).

The Metropolitan Readiness Test validation information focused on content and predictive validity. Content validity was initially established through a careful study of reading processes and research. Items were then developed to assess the identified areas. Test items were later tried out and analyzed for appropriateness. Consultation with experts was not mentioned and details of the procedures were limited. Predictive validity studies compared MRT scores to achievement scores attained later by the same children. In one study, 700 kindergarten children were given the MRT, Level I, in November and were administered the Metropolitan Achievement Test, Primer Level the following April. Individual subtest correlations averaged about .55. Skill area and composite score comparisons with the primer substest scores were higher, averaging .63 and .70. Level II was administered in the fall to over 4,000 children. The following spring these children took either the Metropolitan Achievement Test, Primer Level or the Stanford Achievement Test, Primary I Levels. The MRT skill area scores were compared with achievement test scores and yielded coefficients primarily in the .50s and .60s. Composite score comparisons with the achievement test scores showed coefficients in the .70s.

The Metropolitan Readiness Test is a well established instrument. The reliability is sound and shows strong internal consistency and equivalent form coefficients. Validity is well studied and includes content and predictive information.

The Stanford Early School Achievement Test Validity information is not clearly presented in the manual. Content validity is not specifically addressed and no mention of consultation with experts is stated. Derivation of items is

not presented. The SESAT is compared to the Otis-Lennon Mental Ability Test. For Level I and II coefficients are moderate as reported for the subtests on SESAT and the Otis-Lennon. Predictive validity is not presented.

The Stanford Early School Achievement Test is a comprehensive instrument which presents strong standardization. Reliability studies show moderate strength. Since content validity is not addressed, the actual purpose of SESAT is questionable. Predictive validity and general areas of validation are neglected in the test manuals.

Table 1

Reliability And Predictive Validity Of Instructionally-Related Assessment Instruments For Preschool Children

TEST	RELIABILITY		VALIDITY
	Internal Consistency	Test/ Retest	Predictive Validity
1. Boehm Test of Basic Concepts Form A Form B	.81 to .90	.72 to .88	N.I.[1]
2. Circus	.60 to .90	N.I.	.57 (6 mo. interval)
3. California Achievement Test	.73 to .96	.48 to .76	N.I.
4. Comprehensive Tests of Basic Skills	.62 to .92	.40 to .78	N.I.
5. Metropolitan Readiness Tests	.68 to .93	N.I	.50s to .70s (5 mo. interval)
6. Stanford Early School Achievement Tests	.94 to .97	N.I.	N.I.

[1]N.I. = No Information.

Summary

The assessment of preschool children began in America at the turn of this century through the use of observational techniques. The interpretation of diary studies assessed the language of early childhood subjects in the early 1900s. Through the 1920s and 1930s observational studies were paramount in determining developmental norms for language and general early childhood development. Through the 1940s and 1950s assessment of language and cognitive skills became the focus.

In the 1960s assessment interest moved toward a more structured criteria oriented focus to assess academic readiness and skill mastery. Through the 1970s emphasis was placed on the development and standardization of instructionally-related assessment instruments to be used to evaluate the effectiveness of early childhood programs as well as the skill mastery of young children. In addition to the development of new instructionally-related assessment instruments, during the 1960s and 1970s IQ tests were widely used to assess children involved in research studies. Later follow-up studies of these initial research programs showed the importance of including achievement as well as intelligence test scores in assessing the longitudinal value of compensatory preschool programs.

The above investigation of six instructionally-related achievement tests currently used to assess preschool children reveals instruments appropriate for evaluating instruction related cognitive abilities of children but inappropriate for predicting the future academic success of these children. Generally poor validation of these instruments confounds the predictive value they might

offer. Only two instruments reviewed investigated predictive validity. Only short term predictive coefficients were presented for these instruments. No longitudinal studies following subjects through the early school years were presented in the test manuals. The need for an instructionally related assessment instrument which offers predictive validity for the early school grades is evident.

CHAPTER III

DESCRIPTION OF THE DESIGN AND PROCEDURES OF THE STUDY

Chapter III is divided into five major sections to detail the procedures used in this study. They are as follows:

1. The research design;
2. The description of the sample population;
3. A description of the data collection methods;
4. Descriptive information regarding the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test; and
5. Statistical procedures used for the treatment of the data.

Research Design

The main purpose of this study was to investigate the validity of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test in predicting academic school achievement in the early school grades; 1, 2, 3, and 4. The primary relationship which was important to this study was the relationship between scores attained by preschool children on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and scores obtained on subsequent early academic school achievement tests. Factors which were relative to the primary relationship which was investigated included age of the preschool participants, sex of the preschool participants, and programs in which the preschool participants were enrolled.

Age of Preschool Participants

The relationship between scores obtained by preschool participants on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test (PLACE) and early academic school achievement as measured by standardized achievement tests administered in the early academic school programs was examined. The relationship between scores obtained on PLACE by 3 year old, 4 year old and 5 year old participants and early academic school achievement was investigated. T and z scores were used for comparison of performance on PLACE and subsequent academic achievement tests.

Male and Female Participants

The relationship between scores obtained on PLACE by male subjects and their subsequent early academic school achievement was investigated. The relationship between scores obtained on PLACE by female subjects and their subsequent early academic school achievement was also examined. Comparisons of T scores on PLACE and z scores on subsequent academic school achievement tests were examined. These comparisons were included in the study to determine if further differences were noted with their introduction.

Compensatory and General Preschool Programs

The relationship between scores obtained on PLACE by compensatory preschool subjects and their subsequent early academic school achievement were investigated. The relationship between scores obtained on PLACE by general preschool subjects and their subsequent early academic school achievement was also examined. T scores on PLACE and z scores on subsequent academic school achievement tests were used as a basis of comparison. These factors were included in the study to determine if further differences were evident with their presentation.

Sample Population

Nine school districts located throughout two counties in Northern California were utilized to obtain this sample of early grade pupils. School districts located in Sacramento County which were included in this study to obtain this sample were Folsom Cordova Unified, North Sacramento Elementary, Sacramento City Unified, and San Juan Unified. San Joaquin County school districts included Lincoln Unified, Lodi Unified, Manteca Unified, Stockton Unified, and Tracy Elementary. The names of subjects to be located and used in this study were taken from master rosters of preschool children who had been sampled in 1978 in the PLACE Project study (Basta-Brislain, 1978).

In the 1978 PLACE Project a cross sectional survey of 444 preschool boys and girls ages 3 years to 5 years 11 months was conducted. The subjects of this study were chosen randomly from the class rosters of 19 preschool sites located throughout four counties in Northern California. Counties and individual preschool sites determined to be representative of the socio-economic composition of this state were chosen. Preschool sites included general and compensatory preschool programs, and represented both the private and public sector. In this study 224 boys and 220 girls were sampled. In general preschool programs, 212 children were sampled while 232 children sampled were enrolled in compensatory or publicly funded preschool programs. The sample was comprised of 118 three years olds, 207 four year olds, and 119 five year olds. Caucasians in the sample totaled 205, with 58 blacks, 92 Chicano, 13 Asian, and 13 East Indian children surveyed. Participants who were not identified for an

ethnic category totaled 63. A summary of the 1978 sample population is provided in Tables 2, 3, 4 and 5.

The sample population for this study was comprised of 146 early school children who were located from the master rosters of the 1978 PLACE Project. While 156 children were located, early academic achievement data were available for only 146 of these subjects. Age of participants ranged form 8 years to 10 years 11 months. The sample population included 22 subjects who were between 3 years and 3 years 8 months old in 1978. Forty-eight subjects were included who were between 3 years 9 months and 4 years 3 months in 1978. Forty-nine subjects were studied who were between 4 years 4 months and 5 years 2 months in 1978. Twenty-seven subjects were studied who were 5 years 3 months or older in 1978. Male subjects numbered 80 with 66 female subjects included. Compensatory program subjects included numbered 63 with 83 general program subjects studied. Early school grades on which achievement data were recorded included kindergarten, first, second, third, and fourth. Of the subjects located for this study, 4 were enrolled in special education and 142 were enrolled in regular education programs. A summary of the sample population is presented in the Tables 6 and 7.

Table 2

Geographic Summary of Sample Population

	Sample 1978		Sample 1983
ALAMEDA COUNTY	26	TOTAL	0
NEWARK UNIFIED SCHOOL DISTRICT	26	TOTAL	0
SACRAMENTO COUNTY	201	TOTAL	91
FOLSOM-CORDOVA UNIFIED SCHOOL DISTRICT	46		9
NORTH SACRAMENTO UNIFIED SCHOOL DISTRICT	31		5
SACRAMENTO CITY UNIFIED SCHOOL DISTRICT	85		49
SAN JUAN UNIFIED SCHOOL DISTRICT	39		22
SAN JOAQUIN COUNTY	173	TOTAL	65
LINCOLN UNIFIED SCHOOL DISTRICT	0		6
LODI UNIFIED SCHOOL DISTRICT	45		21
MANTECA UNIFIED SCHOOL DISTRICT	27		3
STOCKTON UNIFIED SCHOOL DISTRICT	80		36
TRACY UNIFIED SCHOOL DISTRICT	21		5
STANISLAUS COUNTY	44	TOTAL	0
MODESTO CITY SCHOOL DISTRICT	44		0
	444	TOTAL	156

Table 3

Ethnic Groups Represented in 1978 Sample Population

	Number	Percent of Sample Population
Caucasian	205	46.2
Chicano	92	20.7
Black	58	13.1
Asian	13	2.9
East Indian	13	2.9
Other	63	14.2

Table 4

Age Groups Represented in 1978 Sample Population

AGE (years-months)	Number	Percent of Sample Population
3-0 to 3-11	118	26%
4-0 to 4-11	207	47%
5-0 to 5-11	119	27%

Table 5

Summary of Male and Female Participants by Age in 1978 Sample Population

AGE (years-months)	Male	% of Sample Population	Female	% of Sample Population
3-0 to 3-11	51	11%	67	15%
4-0 to 4-11	107	24%	100	23%
5-0 to 5-11	66	15%	53	12%
Total	224	50%	220	50%

Table 6

Age of Sample Population

1978 age	1983 age	Number	% of Sample Population
3-0 to 3-8	8-0 to 8-8	22	15%
3-9 to 4-3	8-9 to 9-3	48	33%
4-4 to 5-2	9-4 to 10-2	49	34%
5-3 +	10-3 +	27	18%

Table 7

Summary of Sample Population

Title	Number	Title	Number
Male	80	Female	66
Compensatory Program	63	General Program	83
Regular Education	142	Special Education	4

Data Collection Methods

Information compiled on each subject included three primary types: 1) identification information regarding name, age, sex, case number, program, and location in 1978; 2) assessment information on PLACE in 1978; and 3) early school achievement information in the areas of reading, math, and language. The following is a description of details and procedures used for each type of information collected.

Identification Information

In 1978 during the PLACE Project Study information regarding name, age, sex, case number, program, location, and test score was gathered and stored. At the beginning of this current study a computer print out was prepared which contained information regarding the subject's case number, sex, name, birthdate, chronological age in 1983, probable grade in 1983, chronological age in 1978, county where the individual was initially tested in 1978, the site at which the initial testing in 1978 took place, and the school district in which the preschool site was geographically located. This master roster was duplicated and used to locate subjects in the current study in each of the four counties initially surveyed. This master roster was compared to school district student

rosters within the four counties in order to locate target subjects who had been involved in the 1978 study. When a student was located by name, information was coded according to the individual's case number and the name of the individual was dropped. This procedure was used in order to protect the anonymity of subjects being studied.

In order to obtain access to school district and school site rosters, an introductory information packet was prepared and presented to school district administrators. This information packet included a 1978 geographic sample summary regarding county and sites sampled and the master roster which was prepared for this study. The packet also contained an introductory letter and a brief summary of the study. Introductory letters from the district administrator or school administrator were requested to introduce the research clinicians to school site personnel. This letter was presented by research clinicians when they requested access to cumulative folders which contained achievement test scores.

Assessment Information on PLACE

Assessment information on PLACE gathered in 1978 was reviewed for each target subject who was located in the current study. The mean score and standard deviation for the subject's chronological age level were recorded. The individual's score was converted to a T score equivalent for the purpose of comparison in the current study.

Early School Achievement Information

Information regarding target subjects' academic achievement was obtained and recorded for the areas of reading, math, and language. Through the use of

cumulative records, achievement scores were recorded for each subject included in the study. Raw scores, standard scores, percentile ranks and grade level scores were recorded for each grade level on which information was available. Achievement information was gathered through the use of scores derived from standardized achievement tests routinely given in the early school grades in the district where the pupils were enrolled.

Tests from which scores were recorded in the study were the California Achievement Test forms C and D, the Comprehensive Tests of Basic Skills forms A, B, C, D, U, 1 and 2, the Iowa Test of Basic Skills form 7, the Language Arts Scope and Sequence forms 1, 2, 3, and 4, the Math Scope and Sequence forms 1, 2, 3 and 4, the Stanford Achievement Test form A, and the Wide Range Achievement Test level 1.

Information regarding the pupil's case number, school year when data were collected, school grade when data were collected, and test scores were recorded. Columns for each of the achievement areas of language, reading, and math were recorded on a grid prepared for computer processing.

Description of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test

The development of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test (PLACE) originated to provide an assessment instrument which would evaluate individual language and cognitive skill development of preschool age children, 3 to 6 years old. The need for an instrument to be used by para-professionals and teachers rather than

psychometrists was documented in the literature and by preschool personnel (Lofgreń, 1978). Initial construction focused on development of a criterion referenced instrument to be used by teachers and para-professionals in preschool educational programs. Further studies of the instrument focused on normative validity.

The initial step in test construction focused on development of a preliminary list which included 18 skills and concepts related to language and cognitive development during ages 2 to 7 years. These skills were selected from the work of researchers in the field whose instruments assessed language and cognitive skills between ages 2 and 7 years. Selection of appropriate instruments for study was made after investigation of the Headstart Test Collection, Buros' Tests in Print, Doctoral Dissertation Abstracts, and commonly used tests listed in Frost and Kissinger (1976), Calvin and Zaffiro (1974), and Jordan, Hayden, Karnes, and Wood (1977), Lofgren, (1978). Forty assessment instruments were studied for developmental organization.

Following development of the preliminary skill list, a comprehensive skill matrix was constructed which included developmental skills from 2 to 8 years. Included in this comprehensive matrix were eight divisions which reflected the normal developmental schedule of language and cognitive skills, according to consensus of experts as presented in Developmental Guidelines, Compiled from Selected Sources (Karnes, undated).

Skills below and above the target age span of 3 years to 5 years-11 months were included to identify slow and rapid developmental patterns. Using this

matrix, 181 test items were written, constituting the first edition of PLACE, to measure each skill or concept in appropriate developmental sequence. Following consultation with experts in the field, the second edition of PLACE was developed which included 99 test items. Where the age level appropriateness of an item was questionable, the item was administered to children in a preschool program whose ages spanned the area of doubt plus and minus one year.

Following careful study regarding presentation of items to children, a third edition of PLACE was prepared which included an assessment kit. The kit was composed of concrete and representational material for 67 of the 99 items. Using this edition, initial field testing of PLACE was conducted at three Child Care Centers in Modesto, California. Thirty-one children were selected from this lower socio-economic class population by their teachers for the purpose of obtaining seriously needed information regarding developmental skills and learning readiness. Assessment was concurrently conducted on 15 other children ages 4 years to 5 years 8 months who were known to be advanced in development. This group was assessed to obtain data on items above 6 years although no individual was older than 5 years-8 months. Following this field testing, some items were rewritten for simplification, and some were eliminated.

Reliability of The Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test

Reliability of PLACE was determined regarding test-retest and inter-rater consistency. Using the Pearson Product Moment Coefficient of Correlation procedures, a test-retest coefficient of .86 was computed with an interval of 10

days. Inter-rater reliability was assessed through the use of four raters who were equally trained in PLACE administration. They were each employed at a preschool center and were concurrently enrolled in a para-professional training class. Each rater administered PLACE to each of the same group of ten children. An inter-rater reliability coefficient of .97 was computed using Kendall's Correlation of Concordance procedure.

Reliability was also examined regarding internal consistency. The relationship between each individual test item and the total test score was investigated. Using the Pearson Product Moment Coefficient of Correlation procedures, a positive coefficient of .84 was derived. A split-half reliability coefficient of .97 was derived applying the Cronbach procedure.

Validity of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test

Content validity using the Kerlinger procedures was examined when the revised edition of PLACE was submitted for evaluation to three authorities in the field of preschool education. Items were evaluated for relevancy, sequence of placement, appropriateness of wording and information being extracted. Revisions were made in accordance with expert critiques. New items were added to total 114 test items.

Criterion validity was evaluated through the correlation of rankings of students by three preschool teachers and rank order of scores obtained by those same students on the PLACE assessment. Each teacher was asked to rank designated age level students, 3, 4, or 5 year olds, in terms of skill mastery

using the list of skills and concepts taken from PLACE. The three correlation coefficients were r = .62, r = .62, r = .21 as determined by the use of the Spearman Rank Order Correlation procedure.

Normative validity of PLACE was established during the PLACE Project in 1978. This study was a cross-sectional survey of preschool boys and girls ages 3 years to 5 years 11 months. The subjects of the study were chosen randomly from the class rosters of 19 sites located througout four counties in Northern California. Counties and individual school sites determined to be representative of the socio-economic and ethnic composition of the state preschool population were chosen. School sites included general and compensatory preschool programs, private and public.

Each student attending preschool classes at the 19 selected sites was assigned a number successively as his or her name appeared on the school class roster. Using a table of random numbers, numbers were then randomly selected from each roster. The sample totaled 444, with 224 boys and 220 girls. Two hundred twelve children were sampled in general or private preschool programs. Two hundred thirty-two children were sampled in compensatory or publicly financed programs.

The subjects were administered the PLACE test on a one-to-one basis by a trained clinician. Sixteen graduate students from the University of the Pacific, School of Education were selected as clinicians for this study. Each clinician received 15 hours of training in the philosophy, construction, content and administration of the instrument. Each clinician was also required to

administer the instrument three times prior to beginning administration for purpose of this study. The administration of the instrument was to be completed within 30-minute intervals. The subjects' responses were recorded and tallied on the test protocol sheet by the clinician during the testing interval. The basal, ceiling, and raw scores were computed for each subject.

The data which were collected in this study were analyzed to determine the standard level of performance for boys and girls in three age groups: 3 years to 3 years 11 months, 4 years to 4 years 11 months, and 5 years to 5 years 11 months. A mean, median, mode, standard score, T score, percentile score, and standard deviation were computed for each age group. These data were then stored to be used in this current study.

Statistical Procedures

An analysis of the data was conducted to determine the relationship between scores obtained by preschool children on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and subsequent early academic school achievement. The Pearson Product Moment Coefficient of Correlation was used in the analysis. The following discussion describes the procedures which were utilized to test each subquestion:

Subquestion 1. What is the relationship between scores attained on PLACE by 3 year old subjects and their subsequent early academic school achievement?

Subquestion 2. What is the relationship between scores attained on PLACE by 4 year old subjects and their subsequent early academic school achievement?

Subquestion 3. What is the relationship between scores attained on PLACE by 5 year old subjects and their subsequent early academic school achievement?

For each of these subquestions a correlation was computed between the subject's score on PLACE in 1978 and their subsequent scores attained on achievement tests in the areas of reading, math, and language. Mean scores attained on PLACE were converted to T score equivalents. For the purpose of comparison standard scores achieved on academic achievement tests in the areas of reading, language, and math were converted to z score equivalents. A correlation coefficient was computed to compare the relationship between scores attained on PLACE by each age group of children and scores attained on early academic school achievement tests which were administered periodically during grades 1, 2, 3, or 4. Through the use of the Pearson Product Moment Coefficient of Correlation procedure coefficients were computed. Tables reflecting the data described according to the analysis are presented in Chapter IV.

Subquestion 4. What is the relationship between scores attained on PLACE by male subjects and their subsequent early academic school achievement?

Subquestion 5. What is the relationship between scores attained on PLACE by female subjects and their subsequent early academic school achievement?

The T scores for male subjects and female subjects were computed for PLACE and z scores were computed for subsequent achievement tests on which the early academic school progress was assessed. Through the use of the

Pearson Product Moment Coefficient of Correlation the relationship between scores attained by male subjects and scores attained by female subjects on PLACE were compared with subsequent scores on academic achievement tests. A correlation coefficient was computed for this comparison for the entire sample population. Tables reflecting the significance of the coefficients between the scores as described according to the analysis are presented in Chapter IV.

Subquestion 6. What is the relationship between scores attained on PLACE by compensatory preschool subjects and their subsequent early academic school achievements?

Subquestion 7. What is the relationship between scores attained on PLACE by general preschool subjects and their subsequent early academic school achievement?

The T scores for compensatory preschool subjects and general preschool subjects on PLACE were compared with the z scores on subsequent academic achievement tests administered during early school grades; 1, 2, 3, and 4. The Pearson Product Moment Coefficient of Correlation procedure was used to compute the correlation between these scores attained by compensatory and general subjects. A correlation coefficient was computed for the total sample population. A table reflecting the data as described according to the analysis is presented in Chapter IV.

The SPSS programs were used to apply and compute each of the statistical procedures described. A .05 level of significance was applied for this study.

Summary

The research design of this study focused on the relationship between scores obtained by preschool children on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and scores obtained on subsequent early academic school achievement tests. Factors which were important to the primary relationship that was investigated included age of the participants, gender of the participants, and programs in which the preschool participants were enrolled.

The study included 146 early school children who were located in nine school districts and two counties in Northern Caifornia. Participants were located on school district rosters using a master list of preschool children who had been sampled in 1978 in the PLACE Project study. Data were collected regarding participants' early academic achievement in the areas of reading, math and language.

A description of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test was presented in this chapter. Information pertaining to the reliability and validity of the test was included. General characteristics of the instrument were also discussed.

Identification information was collected for each participant in conjunction with academic test scores. Data were statistically analyzed

through the application of the Pearson Product Moment Coefficient of Correlation procedure. Each subquestion was investigated and the findings are presented in Chapter IV.

CHAPTER IV

RESULTS OF THE STUDY

Chapter IV presents the results of this study which was conducted to investigate the validity of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test in predicting academic school achievement in the early school grades; 1, 2, 3, and 4. The primary relationship which was important to this study was the relationship between scores attained by preschool children on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and scores obtained on subsequent early academic school achievement tests.

Three factors were relative to the primary relationship which was being investigated. The first factor related to the age of the participants. The second factor focused on the gender of the participants. The third factor concerned the program in which the preschool participant was enrolled when the initial data were collected. The results were analyzed to determine whether or not there was a significant relationship between scores obtained on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and early academic achievement; and second, whether or not the factors of age, gender, and program were also significant in the relationship. The information in this chapter was analyzed through the use of the Pearson Product Moment Coefficient of Correlation procedure.

This chapter presents the statistical information which relates to each subsequestion. A discussion of the results and a summary of the findings are also included.

Presentation of Findings

Subsquestion 1. What is the relationship between scores attained on PLACE by 3 year old subjects and their subsequent early academic school achievement?

No positive relationship between PLACE scores and grade 1 achievement in reading, language, or math was reliably documented. Statistically, when PLACE scores were compared with achievement scores in the areas of reading, language and math a significant correlation did not appear.

A significant positive relationship was documented between PLACE scores and grade 2 achievement in reading and math. No significant relationship was established between PLACE scores and language achievement at grade 2.

A significant positive relationship was documented between PLACE scores and grade 3 achievement in language and math. No significantly positive relationship was documented between PLACE scores and reading achievement at grade 3. Table 8 presents a summary of these data.

Generally, the data showed a strong relationship between PLACE scores and academic achievement for 3 year old subjects as the child progressed in grade level ranking. First grade children showed no significant relationship between the scores they attained on PLACE and reading, language, and math

Table 8

3 Year Old Subjects: PLACE Scores and Early Academic Achievement

		Reading	Language	Math
Grade 1	r	.398	.509	.445
	n	10	6	10
	p	.127	.151	.099
Grade 2	r	.602	.399	.598
	n	21	16	21
	p	.002 *	.063	.002 *
Grade 3	r	.309	.494	.661
	n	15	15	15
	p	.131	.030 *	.004 *

*Significant relationship

achievement scores. In second grade the relationship began to strengthen and held in third grade achievement. Math achievement appeared to be most closely linked to the PLACE scores these children attained.

Subquestion 2. What is the relationship between scores attained on PLACE by 4 year old subjects and their subsequent early academic school achievement?

A positive relationship was significantly documented between PLACE scores and grade 1 achievement in language and math. No significantly positive relationship was documented between PLACE scores and reading achievement at grade 1.

A significant positive relationship was documented beteween PLACE scores and achievement in math and language at grade 2. No significant

relationship was documented between PLACE and reading achievement at grade 2.

A significant positive relationship was documented between PLACE scores and reading and math achievement at grade 3. No positive reliable relationship was documented between PLACE scores and language achievement at grade 3.

A significant positive relationship was documented between PLACE scores and achievement in reading and math at grade 4. No reliable relationship was documented between PLACE scores and achievement in language at grade 4. Table 9 presents a summary of these data.

Table 9

4 Year Old Subjects: PLACE Scores and Early Academic Achievement

		Reading	Language	Math
Grade 1	r	.116	.598	.586
	n	11	9	9
	p	.367	.044 *	.048 *
Grade 2	r	.057	.344	.364
	n	35	22	36
	p	.371	.058 *	.014 *
Grade 3	r	.256	-.034	.327
	n	39	26	39
	p	.057 *	.434	.021 *
Grade 4	r	.330	.231	.479
	n	25	23	24
	p	.053 *	.144	.009 *

*Significant relationship

The data showed a significant positive relationship between PLACE scores and math achievement for 4 year old subjects in all four grades. A positive

relationship was documented between PLACE scores and language achievement in the lower grades while a positive relationship in reading achievement was documented for the two upper grades. Although it was not significantly documented, an inverse relationship was implied for these children between PLACE scores and language achievement at grade 3.

Subquestion 3. What is the relationship between scores attained on PLACE by 5 year old subjects and their subsequent early academic school achievement?

No reliable relationship was documented between PLACE scores and achievement in reading, language, and math at the grade 1 level. While coefficients implied a moderate relationship in math, this was not significantly reliable.

A significant positive relationship was documented between PLACE scores and reading, language, and math achievement at the grade 2 level. All three academic areas were significantly related to the scores the child attained on PLACE during the preschool level.

A significant positive relationship was documented between PLACE scores and achievement in reading, language, and math at grade 3 level. While math showed the strongest relationship, all areas presented significant relationships.

A significant positive relationship was documented between PLACE scores and achievement in reading, language, and math at grade 4 level. While reading showed the strongest positive relationship, all areas were significantly positive

in their relationship to PLACE scores. Table 10 presents a summary of these data.

Table 10

5 Year Old Subjects: PLACE Scores and Early Academic Achievement

		Reading	Language	Math
Grade 1	r	.168	-.752	.639
	n	3	3	3
	p	.446	.229	.279
Grade 2	r	.409	.511	.598
	n	17	13	21
	p	.051 *	.037 *	.021 *
Grade 3	r	.473	.538	.573
	n	20	17	19
	p	.018 *	.013 *	.005 *
Grade 4	r	.604	.362	.530
	n	22	20	22
	p	.001 *	.058 *	.006 *

*Significant relationship

Generally, the data pertaining to 5 year old subjects documented a positive relationship between PLACE scores and reading, language, and math achievement in grades 2, 3, and 4. No significant relationship was established between PLACE scores and grade 1 achievement in reading, language, and math. As subjects proceeded in school, the relationship became stronger between PLACE scores and academic achievement. Math achievement presented the most positive direct relationship with regard to preschool PLACE scores.

Subquestion 4. What is the relationship between scores attained on PLACE by male subjects and their subsequent early academic school achievement?

No reliable relationship was demonstrated between scores attained on PLACE and achievement in reading, language, and math in grade 1. An inverse relationship was implied in the area of language achievement, but this relationship was not to the level of significance.

A significant positive relationship was demonstrated between PLACE scores and language achievement in grade levels 1 and 2 for 4 and 5 year old subjects. No reliable relationship was demonstrated between PLACE scores and achievement in reading and math at grade levels 1 and 2 for 4 and 5 year old subjects.

A significant positive relationship was demonstrated between PLACE scores and achievement in language for grade levels 1, 2, and 3 for 3, 4, and 5 year old subjects. No reliable relationship was established between PLACE scores and reading and math achievement at these grade levels.

A significant positive relationship was demonstrated between PLACE scores and achievement in reading, language, and math at grade levels 2, 3, and 4 for 3, 4, and 5 year old subjects. While the strongest positive relationships were demonstrated in reading and math, language significantly related to PLACE scores of 3, 4, and 5 year old participants.

A significant positive relationship was demonstrated between PLACE scores and achievement in reading, language, and math at grade levels 3, 4, and 5 for 3, 4, and 5 year old subjects. The relationship between PLACE scores and math achievement presented the strongest data. Table 11 presents a summary of these data.

Table 11

Male Subjects: PLACE Scores and Early Academic Achievement

		Reading	Language	Math
Grade 1 (5 yr. olds)	r	.168	-.752	.639
	n	3	3	3
	p	.446	.229	.279
Grade 1-2 (4-5 yr. olds)	r	.312	.557	.271
	n	18	16	16
	p	.103	.012 *	.154
Grade 1-2-3 (3-4-5 yr. olds)	r	.133	.390	.458
	n	56	40	56
	p	.163	.006 *	.000
Grade 2-3-4 3-4-5 yr. olds)	r	.367	.319	.397
	n	65	50	65
	p	.001 *	.012 *	.001 *
Grade 3-4-5 (3-4-5 yr. olds)	r	.363	.341	.364
	n	65	50	65
	p	.007 *	.011 *	.006 *

*Significant relationship

Generally, the data presented a positive relationship between the scores male subjects attained on PLACE and language achievement. As male subjects proceeded through the early grades, the relationship between PLACE scores and achievement in reading, language, and math generally increased. At grade levels 2, 3, 4, and 5, male subjects presented significant positive relationships between PLACE scores and achievement in reading, math, and language. At grade level 1 no reliable relationship was demonstrated between PLACE scores and early academic achievement in reading, language, or math. Male subjects demonstrated a positive reliable relationship between PLACE scores and reading achievement in grade levels 2, 3, 4, and 5 only. When data were analyzed for grade levels 1, 2, and 3 no significant positive relationship was

demonstrated between PLACE scores for male subjects and reading achievement.

Subquestion 5. What is the relationship between scores attained on PLACE by female subjects and their subsequent early academic school achievement?

A significant positive relationship was demonstrated for 4 and 5 year old subjects in grades 1 and 2 between scores attained on PLACE and achievement in language and math. No positive reliable relationship was demonstrated for these subjects at these grade levels in the area of reading achievement.

No reliable relationship was demonstrated for 3, 4, and 5 year old subjects in grades 1, 2, and 3 between scores attained on PLACE and achievement in reading, language, or math. When data were analyzed for subjects grouped in this manner no reliable relationship was established.

A significant positive relationship was demonstrated for 3, 4, and 5 year old subjects in grades 2, 3, and 4 between scores attained on PLACE and achievement in reading and math. While an inverse relationship was implied between PLACE scores and language achievement among this group, the relationship was not at a significant level.

A significant positive relationship was demonstrated for 3, 4, and 5 year old subjects in grades 3, 4, and 5 between scores attained on PLACE and achievement in reading, language, and math. While the strongest relationship was demonstrated in the area of math achievement, both language and reading

presented significant correlations for female subjects. Table 12 presents a summary of these data.

Table 12

Female Subjects: PLACE Scores and Early Academic Achievement

		Reading	Language	Math
Grade 1-2 (4-5 yr. olds)	r	.245	.722	.774
	n	12	8	8
	p	.221	.022 *	.012 *
Grade 1-2-3 (3-4-5 yr. olds)	r	.157	.238	.140
	n	42	29	42
	p	.160	.106	.187
Grade 1-2-3 (3-4-5 yr. olds)	r	.313	-.084	.344
	n	55	39	55
	p	.010 *	.305	.005 *
Grade 3-4-5 3-4-5 yr. olds)	r	.405	.277	.443
	n	38	37	37
	p	.006 *	.048 *	.003 *

*Significant relationship

Female subjects demonstrated a diverse pattern when the relationship between achievement and PLACE scores was investigated. At grade levels 1, 2, and 3, 3, 4, and 5 year old females did not demonstrate a significant relationship between PLACE scores and early academic achievement. When information regarding 4 and 5 year old females in grades 1 and 2 was analyzed, a significant positive relationship was demonstrated in the areas of language and math achievement. As female subjects moved through the primary grades, the relationship between PLACE scores and academic achievement became more apparent. Female subjects who were initially 3, 4, and 5 years old demonstrated a significant positive relationship between general academic

achievement and scores obtained on PLACE in grades 3, 4, and 5. Generally, female subjects demonstrated a more positive comprehensive relationship between PLACE scores and general academic achievement as they matured.

Subquestion 6. What is the relationship between scores attained on PLACE by compensatory preschool subjects and their subsequent early academic school achievement?

No reliable, positive relationship was demonstrated for compensatory preschool subjects between scores attained on PLACE and reading achievement. No significant positive relationships were documented at grade levels 1, 2, 3, or 4.

A significant positive relationship was demonstrated by compensatory preschool program subjects between PLACE scores and language achievement at grade levels 1, 2, and 3. This positive direct relationship was documented for subjects who had initially been 3, 4, or 5 years old when tested on PLACE. No reliable relationship was demonstrated for compensatory program preschool subjects between PLACE scores and language achievement at grade level 4.

A significant positive relationship between scores attained on PLACE and math achievement was demonstrated for 3, 4, and 5 year olds in grades 1, 2, 3, and 4. When data for 4 and 5 year old subjects in grades 1 and 2 were analyzed no reliable relationship was documented in math. Table 13 presents a summary of these data.

Table 13

Compensatory Program Subjects: PLACE Scores and Early Academic Achievement

		Reading	Language	Math
Grade 1-2 (4-5 yr. olds)	r	.415	.879	.379
	n	11	5	5
	p	.102	.025 *	.264
Grade 1-2-3 (3-4-5 yr. olds)	r	.162	.320	.305
	n	38	26	37
	p	.165	.055 *	.033 *
Grade 2-3-4 (3-4-5 yr. olds)	r	.191	-.201	.358
	n	45	32	45
	p	.103	.135	.008 *
Grade 3-4-5 3-4-5 yr. olds)	r	.291	.302	.337
	n	26	25	25
	p	.074	.071	.050 *

*Significant relationship

The data concerning compensatory program subjects indicate no reliable relationship between scores attained on PLACE and early academic achievement in the area of reading. The data present a positive and significantly reliable relationship between scores attained on PLACE and early academic achievement in grades 1, 2, and 3 in the area of language. The data also present a positive and significant relationship between scores attained on PLACE and early academic achievement in grade 1, 2, 3, and 4 in the area of math. While the relationships documented in this study do not present a relationship between scores attained on PLACE and reading achievement, they do document a reliable relationship between scores attained on PLACE and language and math achievement of compensatory preschool subjects.

Subquestion 7. What is the relationship between scores attained on PLACE by general preschool subjects and their subsequent early academic school achievement?

A significant positive relationship was demonstrated by general preschool program subjects in grades 1 and 2 between scores attained on PLACE and academic achievement in the areas of reading, language, and math. While math achievement showed the strongest relationship, language and reading achievement also presented significant relationships to PLACE scores.

A positive and significant relationship was demonstrated by general preschool program subjects in grades 1, 2, and 3 between scores attained on PLACE and academic achievement in the areas of reading and math when initial subjects were 3, 4, or 5 years old. No relationship was documented between scores attained by these subjects on PLACE and language achievement.

No relationship was documented for 3, 4, and 5 year old general preschool program subjects at grade level 4 between scores attained on PLACE and academic school achievement in reading, language, or math. While a reliable relationship was documented in reading, language, and math for grade levels 1 and 2, no relationship was established between preschool performance and early academic achievement at grade 4. Table 14 presents a summary of these data.

Table 14

General Program Subjects: PLACE Scores and Early Academic Achievement

		Reading	Language	Math
Grade 1-2 (4-5 yr. olds)	r	.488	.554	.626
	n	18	18	18
	p	.020 *	.008 *	.003 *
Grade 1-2-3 (3-4-5 yr. olds)	r	.215	.583	.369
	n	56	39	57
	p	.056 *	.000	.002 *
Grade 2-3-4 (3-4-5 yr. olds)	r	.528	.504	.395
	n	70	52	70
	p	.000	.000	.000
Grade 3-4-5 3-4-5 yr. olds)	r	.527	.477	.485
	n	53	52	53
	p	.000	.000	.000

*Significant relationship

The data indicate a reliable and significant relationship between scores attained on PLACE and early academic achievement in reading, language, and math for general preschool program subjects in grades 1, 2, and 3. As general preschool program subjects progressed in grade level, the significant relationship between scores attained on PLACE and early academic achievement in reading, language, and math declined. By grade level 4, no significant correlation was documented between scores attained on PLACE by general preschool program subjects and achievement in reading, language, and math.

Summary of Findings

In general, the data documented a significantly more positive direct relationship between scores attained on PLACE and early school achievement for older participants. The 4 year old subjects achieved a greater number of

statistically significant relationships between the scores they attained on PLACE and early academic school achievement than did 3 year old subjects. The 5 year old subjects demonstrated the greatest number of statistically signficant relationships between scores attained on PLACE and early academic school achievement. Scores attained on PLACE for 5 year old subjects were significantly related to all three academic achievement areas at grades 2, 3, and 4, demonstrating the strongest relationship of the age groups explored.

A statistically reliable relationship was documented for compensatory and general preschool program subjects in relation to scores attained on PLACE and language and math achievement. Reading achievement was significantly related to scores on PLACE for general preschool program subjects but not for compensatory preschool program subjects. Scores attained PLACE by general preschool program subjects were more frequently related to early school achievement in grades 1, 2, and 3. Early school achievement in grade 4 did not indicate a significant relationship between scores attained on PLACE by general preschool subjects and academic achievement in reading, language, or math. Significant relationships for compensatory preschool program subjects occurred throughout the early grades.

Interpretation of the Findings

A review of the results presented lead to the following conclusions:

1. The relationship exists between age of participants when evaluated on PLACE, scores attained on PLACE, and early academic school achievement;

2. PLACE scores are more significantly related to academic achievement as pupils mature;
3. PLACE scores and early academic achievement are related to the sex of participants;
4. A relationship exists between PLACE scores, early academic school achievement, and the preschool program in which the child participated;
5. PLACE scores are significantly related to early academic school achievement.

Findings Regarding Age

The finding of this study indicated that a relationship existed between the age of the participant at the time of evaluation on PLACE and the subsequent relationship between that score and early academic achievement in reading, math, and language. The data indicated that for 3 year old subjects, no positive reliable relationship exists between PLACE scores and achievement in the first grade in reading, language, and math. The data also documented that for 3 year olds there was no reliable relationship between PLACE scores and second grade achievement language. General academic achievement of 3 year old subjects in grades 1, 2, and 3 indicates a moderate relationship between PLACE scores and reading, language, and math competency. The data indicate an uncertain pattern of relationship between PLACE scores and academic achievement patterns for these children.

The data indicate that 4 year old subjects demonstrate a stronger pattern of relationship between PLACE scores and academic achievement. This pattern is most clearly significant with PLACE scores in relation to math

achievement, which shows a significant relationship for 4 year old subjects for grades 1, 2, 3, and 4. The data also demonstrate that 4 year old subjects present a pattern of significant relationship between scores on PLACE and language achievement in grades 1 and 2. These findings also demonstrate a significant pattern relationship between reading and scores attained on PLACE at grade levels 3 and 4. Generally, 4 year old subjects presented a more stable and defined pattern of relationship than did 3 year old subjects.

The findings of this study indicate a direct and reliable relationship between scores attained on PLACE and early academic school achievement for 5 year old subjects. In first grade these subjects did not demonstrate a significant relationship between PLACE scores and achievement in reading, language or math. However, by second grade, this group of participants showed a pattern of significant relationship between PLACE scores and academic achievement in all three areas of reading, math, and language. This pattern of relationship continued in grade 3 and grade 4 for 5 year old subjects. Five year old subjects demonstrated the strongest pattern of relationship between PLACE scores and academic achievement demonstrating a significant relationship in three academic areas in all three grades including 2, 3, and 4. The subjects who were 5 years old when initially evaluated on PLACE showed the strongest relationship between scores attained on PLACE and subsequent early academic school achievement in reading, language, and math.

Findings Regarding Grade Level

It was found in this study that as children progressed in their early school grade, the relationship between PLACE scores and academic achievement increased. A moderate relationship between PLACE scores and general

academic achievement in the first grade was documented in this study. Three and five year old subjects did not demonstrate a reliable relationship between their scores on PLACE and reading, language, or math achievement in the first grade. Four year old subjects did, however, demonstrate a significant relationship between the scores they had obtained on PLACE and language and math achievement in the first grade.

A review of the findings indicates that the strongest relationship between scores attained on PLACE and early school achievement are presented in grade levels 2, 3, and 4. A significant and reliable relationship between PLACE scores and math achievement is documented at all age levels for grades 2, 3, and 4. A significant relationship regarding reading achievement in grades 3 and 4 is documented for 4 and 5 year old subjects. The findings of the study significantly document the relationship between PLACE scores and general academic achievement in the areas of reading, language, and math at grade levels 2, 3, and 4.

Findings Regarding the Sex of Participants

An examination of the relationship between sex of the participants upon the finding of this study reveals that both male and female subjects displayed significant relationships between scores attained on PLACE, early school achievement, and their gender. Female subjects showed a significant pattern in the relationship they displayed in math achievement. These female subjects showed a reliable relationship between scores attained on PLACE and math achievement in grades 1, 2, 3, and 4. They did not, however, show an equal relationship in reading or language. Female subjects also showed a significant relationship between PLACE scores and language achievement in grades 1 and 2

only. Male subjects showed the most significant relationship between PLACE scores and reading, language, and math at grade levels 2, 3, and 4. Male subjects also displayed a significant relationship between PLACE scores and language achievement in grades 1, 2, 3, and 4. While the relationship between PLACE scores and early academic achievement is comparable for male and female subjects, male subjects present a moderately more established pattern of relationship after the first grade. While reading and math achievement patterns are similar for boys and girls in relation to their PLACE scores, language achievement is stronger for boys.

Findings Regarding Program

A review of the data indicates a different pattern of relationship between PLACE scores attained by compensatory preschool subjects than those scores attained by general preschool subjects in relation to early academic school achievement. Compensatory preschool subjects indicated a significant relationship between scores attained on PLACE and language achievement for grades 1, 2, and 3. They also showed a reliable relationship between scores they attained on PLACE and math achievement in grades 1, 2, 3, and 4.

General preschool subjects showed a significant relationship between scores they attained on PLACE and early academic achievement in reading, language and math at grade level 1, 2, and 3. General preschool subjects showed no relationship between scores they attained on PLACE and academic achievement in reading, language, and math when data were analyzed for grades 2, 3 and 4. The relationship between PLACE scores and early academic achievement appears to weaken as general preschool subjects mature.

Compensatory preschool subjects showed a reliable relationship between the scores they attained on PLACE and math achievement in grades 1, 2, 3, and 4. This significant relationship is in direct contrast to the relationship between scores they attained on PLACE and reading achievement. In the area of reading achievement, no significant relationship was documented between PLACE scores and academic progress. Scores attained by compensatory preschool subjects on PLACE predict language and math achievement in grades 1, 2, 3 and 4 but do not appear to have a relationship to reading achievement in any of the early school grades.

Findings Regarding Early Academic School Achievement

The findings indicate that the scores attained by preschool children on PLACE showed the strongest relationship to early academic school achievement in the area of math. Math achievement was significantly correlated with scores attained by children on PLACE after a 1, 2, 3, and 4 year span of time. PLACE scores highly correlated with math achievement in grades 1, 2, 3, and 4. The correlation coefficient ranged in the .30s to low .40s with a significant level of relationship for each correlation.

PLACE scores showed a direct positive relationship to language achievement after a 1, 2, and 4 year span. Language achievement in the early school grades appears to be positively correlated with PLACE scores at grades 1, 2, and 4. After a three-year span of time between completion of PLACE testing and early school enrollment, no significant relationship was measurable between language and PLACE scores. The correlation coefficient between language achievement and PLACE scores ranged from the middle .30s to middle .50s with a reliable level of significance at each correlation level.

The findings for this study indicate that PLACE scores show a positive relationship to reading achievement in the early school grades after a three or four year span. This study found no significant relationship between scores attained on PLACE and reading achievement after a span of one or two years. The relationship between PLACE scores and reading achievement become positive only after three years have passed. The strongest correlation between reading scores and PLACE scores emerged in grades 3 and 4. No relationship between PLACE scores and reading achievement at the first grade level was documented. Correlation coefficients for the relationship between PLACE scores and reading achievement range from the middle .30s to the high .30s and are reliably significant at each of these levels.

A positive direct relationship between scores attained by preschool children on PLACE and early academic school achievement in reading, language, and math is documented in this study. The strongest subject relationship was documented between math achievement and PLACE scores. The strongest correlation coefficient was documented in the relationship between language achievement and PLACE scores. The relationship between reading achievement and PLACE scores was documented at the three and four year span which shows a positive relationship at the third or fourth grade level. This study found a positive direct relationship between scores attained by preschool children on PLACE and early academic school achievement in the areas of reading, language, and math.

Table 15

PLACE Scores and Early Academic Achievement

		Reading	Language	Math
1 year span	r	.28	.55	.41
	p	.06671	.00252 *	.02357 *
2 year span	r	.16	.33	.31
	p	.06251	.00266 *	.00099 *
3 year span	r	.34	.15	.37
	p	.00006 *	.07697	.00001 *
4 year span	r	.39	.34	.40
	p	.0001 *	.001 *	.00009 *

Summary

Chapter IV has included the findings of this study through the application of the Pearson Product Moment Coefficient of Correlation procedure. Each subquestion was studied in relation to the results obtained from the statistical analysis. As discussed throughout Chapter IV, a significant positive relationship exists between scores attained on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and early academic school achievement in the areas of reading, language, and math. A positive direct relationship was documented for each of the factors studied in relation to the primary question. A significant relationship was found between scores attained on PLACE and early academic achievement in reading, language, and math by 3 year old, 4 year old, and 5 year old subjects. A significant relationship was also documented between the sex of the subjects studied in relation to the scores they attained on PLACE and early academic achievement in reading, language, and math. Female subjects showed a significant correlation with math in grades 1, 2, 3, and 4, and with language in grades 1 and 2. Male pupils showed significant

relationships with reading, language, and math in grades 2, 3, and 4. The study also found a positive and significant relationship between scores attained by compensatory and general preschool subjects in relation to the scores they attained on PLACE and early academic achievement in the areas of reading, language, and math. The discovery of these relationships was discussed through the interpretation of the findings as a result of this study.

CHAPTER V

SUMMARY OF THE STUDY

Chapter V has been divided into three sections to summarize and conclude the study. These three sections are as follows:

1. Summary and discussion of the study;
2. Conclusions and recommendations of the study; and
3. Suggestions for further research.

Summary of the Study

The purpose of this study was to investigate the relationship between scores attained on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and subsequent academic achievement in the early school grades; 1, 2, 3, and 4. This relationship was investigated through a comparison of scores attained on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test and subsequent academic achievement scores obtained through the early school grades in the areas of reading, language, and math.

The sample population for this study was comprised of 146 early grade pupils who were located throughout nine school districts in two counties in Northern California. Identification information was compiled on each subject who was included in this study. Information regarding name, age, sex, case

number, program, location, and grade level were included. Assessment information regarding the subjects' score on PLACE and subsequent early school achievement scores in the areas of reading, language, and math were entered on a computer code sheet according to the pupil's case number. Identifying case numbers were assigned to each pupil who participated in this study in order to protect the confidentiality of all children participating in this study. Data collected throughout this study were recorded according to case numbers.

The data gathered on individual subjects facilitated the study of the relationship of each related factor to the primary question being investigated. The effect of age, gender, and preschool program of each subject was explored through a statistical analysis. The relationship of early academic school achievement in the areas of reading, language, and math to scores attained on PLACE was explored.

A review of the literature relevant to this study revealed these areas of inquiry to be appropriate for the following reasons:

1. Early childhood education is a large and stable area of instruction.
2. Programs in the area of early childhood education emphasize the development of language and general cognitive skills.
3. Legislative and funding requirements mandate assessment and evaluation of certain preschool programs.
4. Diagnostic and evaluation procedures in preschool education programs have focused on intelligence testing rather than instructionally-related skill assessment.

5. A review of instructionally-related diagnostic instruments for use with preschool children showed reliable but poorly validated tests.
6. For a study which involves the assessment of preschool language and cognitive skills to produce results which will be useful to educators, the researcher must consider the following:
   (a) Standardization;
   (b) Personnel training requirements for administration;
   (c) Time required for administration; and
   (d) Usefulness of the results.

The Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test was used in this study because it addressed the concerns in these areas. The Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test is an individualized normed instrument which can be administered by classroom personnel in approximately 20 to 30 minutes. It yields information related to language and cognitive skills addressed in the preschool education curriculum.

These reasons for conducting the study also contributed to the research design of this study. They produced the basis for this investigation and contributed to the subquestions which were generated. The conclusions and recommendations from this study follow.

Conclusions and Recommendations

The results of this study indicated that a significant positive relationship exists between scores attained on PLACE and subsequent scores attained on early school academic achievement tests in the areas of reading, language, and

math. The strongest relationship across ages was documented between math achievement and PLACE scores. This finding may be explained by the strong concrete reasoning format presented in PLACE. Labeling, matching and sorting skills are emphasized in lower items on this preschool instrument. These findings provide initial information needed to establish a predictively valid assessment beginning in the preschool education program. The documentation of a positive relationship between scores obtained on PLACE and early school academic achievement in reading, language, and math enables classroom personnel to assess a child's skill level throughout early childhood education. Classroom personnel can determine skill levels for instructional purposes in the preschool and the early school grades.

Conclusions and Recommendations Regarding Early Academic School Achievement

The data collected support the conclusion that scores attained on PLACE predict early academic school achievement in reading, language, and math. The relationship between scores attained on PLACE and early academic achievement in reading, language, and math was significantly positive for 3 year olds, 4 year olds, and 5 year olds. The establishment of these positive relationships indicates that assessment in preschool can successfully predict early academic achievement in grades 1, 2, 3, and 4. This finding is important in relation to early academic program placement, instructional grouping, and individualized academic programming.

Early academic achievement scores in reading, language and math were obtained from pupils' cumulative records and included twenty group and individual achievement tests, enumerated in Chapter III, which were routinely

administered in target school districts included in this study. Coefficients of correlation were computed between the numerous achievement test scores and PLACE scores. With other variables held constant, these coefficients represent general findings regarding achievement in reading, language and math in relation to PLACE scores attained by preschool children. Although the complexity of correlating numerous tests was difficult, the analysis of standard linear scores likely produced data which are generally representative and applicable.

A recommendation resulting from this study would be that preschool classroom teachers administer and analyze the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test in order to ensure appropriate instruction in the areas of reading, language, and math. Materials can be formed and instructional goals can be selected on the basis of scores attained on PLACE. Learning strengths and needs can also be established and a learning profile produced for pupils in the preschool and early academic programs.

Conclusions and Recommendations Regarding Age

The findings of this study regarding the relationship between age, scores on PLACE and early academic achievement established that the age of participants at the time of evaluation on PLACE was related to the relationship between PLACE scores and early academic school achievement scores. These findings established the initial steps in understanding the appropriate age for evaluation of preschool children in order to predict early academic school achievement in reading, language, and math. If a skill assessment pertaining to academic achievement in reading, language, and math in grades 1, 2, 3, and 4 is desired, testing at age 5 will yield the most meaningful information. Assess-

ment at age 4 will yield meaningful data in some areas, while assessment at age 3 will show moderate significance to early academic school achievement.

The results of this study suggest that 3 year old subjects appropriately perform learning tasks which are significantly related to subsequent math achievement in grades 2 and 3. Such tasks as matching, labeling, and sorting were appropriately completed by 3 year old children on PLACE. More abstract concepts related to symbol encoding and decoding were less frequently completed by 3 year olds and may explain the weaker relationship in regard to reading and language achievement and the scores they attained on PLACE.

Four year old subjects demonstrated stronger concrete abilities in labeling, matching, and categorizing. The results of this study suggest that these skills may have enhanced the performance of 4 year olds in the areas of reading and language as well as math. The more highly developed ability of 4 year old subjects to categorize and associate information may be an important variable in the relationship between the scores this group attained on PLACE and early academic school achievement.

The findings of this study also suggest that the more highly developed concrete, associative, and coding skills of 5 year old subjects may be important in the general significant relationship between scores they attained on PLACE and early achievement in reading, language and math. The stronger association and coding skills these children demonstrated may have influenced the significant relationship between reading and language achievement and scores attained on PLACE.

A recommendation resulting from this study would be that classroom teachers examine academic skills of 5 year old pupils on PLACE to determine an academic profile in the areas of reading, language, and math. The data obtained from this assessment can be used in educational decision making for the preschool curriculum as well as the early academic school curriculum in grades 1, 2, 3, and 4.

Conclusions and Recommendations Regarding Grade Level

The findings pertaining to the relationship between grade level, scores attained on PLACE and early academic school achievement indicated that as children progressed in their early school grade, the relationship between PLACE scores and academic achievement increased. The data obtained support a moderate relationship between PLACE scores and academic achievement in reading, language, and math at grade level 1. The data indicated the strongest relationship between scores attained on PLACE and early school achievement in grades 2, 3, and 4.

The moderate relationship between PLACE scores and academic achievement in grade 1 might be understood through a consideration of assessment difficulty in the first grade. The curricular diversity of first grade programs makes evaluation of cognitive skills at this level difficult. The lack of testing experience of first grade children may also impact the reliability of test information. While a more significant relationship between PLACE scores and first grade achievement was anticipated, the complexity of evaluating achievement at the first grade level may explain the moderate relationship between scores attained on PLACE and reading, language, and math achievement at this level.

It is recommended from the results of this study that PLACE scores be used to predict reading, language, and math performance in grade levels 2, 3, and 4. These scores might be used for instructional programming in grade 1. Further research is needed to investigate the predictive relationship between scores attained on PLACE and first grade achievement in reading, language, and math.

Conclusions and Recommendations Regarding Gender

A statistically significant relationship was found to exist between sex of the participants, scores attained on PLACE and early academic school achievement. Male subjects showed the most significant relationship between PLACE scores and language achievement. Female subjects showed the strongest relationship between scores attained on PLACE and math achievement. While gender of the participant was significantly related to scores on PLACE and early academic school achievement, until research provides further illumination regarding the specific differences, no conclusions can be drawn regarding prediction of academic performance.

Conclusions and Recommendations Regarding Program

A statistically significant relationship was found to exist between the preschool program in which the child participated, scores attained on PLACE and early academic school achievement in reading, language, and math. This relationship was significant for both compensatory and general preschool children through the early academic grades 1, 2, and 3. For general preschool children, however, this significant relationship was not applicable in grade 4. One explanation for this pattern with general preschool children might be that at the fourth grade level their rate of skill development exceeded those skills

assessed by PLACE. For compensatory preschool children this pattern did not apply. At grade level 4, PLACE scores were still predictive of early academic achievement for compensatory preschool children.

A recommendation resulting from this study would be that classroom teachers use PLACE scores for educational decision making with regard to general preschool children through grades 1, 2, and 3 only. It is suggested that PLACE scores be used to guide educational decision making for compensatory preschool children through grade levels 1, 2, 3, and 4.

Suggestions for Further Research

The completion of this study has answered preliminary questions regarding the predictive validity of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry Test. Further research is suggested in a number of areas relating to the relationship between PLACE scores and early academic school achievement. These include:

1. Studies investigating the usefulness and applicability of PLACE in preschool programs.
2. Studies investigating the applicability of PLACE in kindergarten educational programs.
3. Studies investigating the relationship between PLACE scores and instructional objectives.

PLACE scores were investigated and examined in a particular manner within this study. Further research would appear warranted to expand the findings in these areas:

1. Studies investigating the relationship between PLACE scores and the early academic school achievement of 3 and 4 year old children.
2. Studies investigating the relationship between gender, scores attained on PLACE and early academic school achievement.
3. Research studies examining the relationship between compensatory preschool children as compared to non-compensatory preschool children in relation to their scores attained on PLACE and subsequent early academic school achievement in grades 5 and 6.
4. Studies investigating the relationship between scores attained on PLACE and early school achievement in grade 1.
5. Research studies examining the relationship between reading skills and scores attained on PLACE in the early school grades 1, 2, 3, and 4.

These additional areas of inquiry with this study would continue to contribute meaningful information regarding preschool learning patterns and early academic school achievement. Findings in each of these recommended areas may lead to the answer of how early school children progress in their educational skill mastery. Until these research questions are answered, however, educators must continue to be committed to serving all individuals with the most appropriate methods and techniques already identified.

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APPENDIX

INTRODUCTION LETTER TO ADMINISTRATORS

Dear

Pursuant to our recent conversation, I am enclosing information regarding my doctoral research project which I am conducting through the University of the Pacific. This project is currently focusing on gathering follow-up data on 444 preschool children who were tested on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry (PLACE), a preschool assessment instrument developed for use by instructional and/or para-professional personnel, in 1978. This current phase of the longitudinal study requires the recording of standard scores achieved by these 444 target children since 1978. The areas of reading, math, and language are being investigated.

The purpose of this current study is to investigate the validity of the Preschool Language-Cognitive Skills Assessment for Curriculum Entry in predicting academic school achievement in the primary school grades; kindergarten, one, two and three. This study seeks to answer one major question; what is the relationship between scores attained by preschool children on the Preschool Language-Cognitive Skills Assessment for Curriculum Entry and subsequent primary academic school achievement?

The initial phase of the project was a standardization study of the PLACE, which was conducted in 1978 during the Project PLACE Study. This study was a cross-sectional survey of preschool boys and girls ages 36 to 71 months. The subjects of the study were chosen randomly from the class rosters of 19 sites located througout four counties in Central California. Counties and individual school sites determined to be representative of the socio-economic composition of the state were chosen. School sites included General and Head Start preschool programs, and represented both the private and public sector.

Each student attending preschool classes at the 19 selected sites was assigned a number successively as his or her name appeared on the school class roster. Using a table of random numbers, children were then selected from

each roster. The sample totaled 444, with 224 boys and 220 girls. 301 children were sampled in regular or private preschool programs, while 143 children were sampled in Head Start or publicly funded programs.

The subjects were administered the PLACE test on a one-to-one basis by a trained clinician. The subjects' responses were recorded and tallied on the test protocol sheet by the clinician during the testing interval. The basal ,ceiling, and raw scores were computed for each subject.

The data which were collected in this initial study were analyzed to determine the standard level of performance for boys and girls in three age groups: 36 to 47 months, 48 to 59 months, and 60 to 71 months. A mean, median, mode, standard score, and standard deviation were computed for each age group.

Utilizing the normative data and samples collected in the PLACE Project Study in 1978, this study will correlate scores obtained by the target subjects on PLACE with standard scores obtained by the target subjects on standardized achievement tests routinely given by their primary school programs to assess reading, math, and language during school years 1978-79, 1979-80, 1980-81 and 1981-82. Rosters have been prepared containing the names, birth dates, sex, age at initial testing, school and district of initial testing, current age, and probable current grade.

These rosters have been classified according to geographic residence at the time of initial testing. Information pertaining to county, either Alameda, San Joaquin, Sacramento, or Stanislaus, and city, either Carmichael, Citrus Heights, Lodi, Manteca, Modesto, Newark, North Sacramento, Sacramento, Stockton, or Tracy has been included. The rosters will be presented to each school district which was originally sampled, Lodi Unified, Manteca Unified, Modesto City Schools, Newark Unified, North Sacramento School District, Sacramento City Unified, San Juan Unified, Stockton Unified, or Tracy Unified, for the purpose of pupil location. School personnel will be requested to indicate pupils that have been served by the district and on whom achievement scores are available for any of the four target years.

When students have been located, anonymous case numbers will be assigned and permission to access files will be requested from their parents or guardians, as required. In cooperation with school districts and appropriate school administrators, a letter of introduction to orient parents to the procedures and purpose of this study will be prepared. Anonymous case numbers will replace student names where possible to protect student privacy.

Information cards will then be prepared on each available subject showing his/her standard score attained on PLACE in 1978 and subsequent standard scores attained on achievement tests in reading, math and language. Standard scores on PLACE will be correlated with standard scores on achievement tests. The relationship between quartile ranking of subjects' scores on PLACE and subsequent achievement tests will be examined.

I am excited about the diagnostic and curricular implications of this project. Your district has been identified as one of the original geographic

locations from which the 1978 sample was compiled. I would greatly appreciate your help in locating our target pupils. I am enclosing a roster of students for whom I am searching. Your cooperation in indicating any of these pupils in your district currently or during any of the target years, 1978-79, 1979-80, 1980-81, or 1981-82, would be very helpful. Without the location of these students, this important project cannot continue. Your efforts are critically important ! Please circle any students in your district and indicate the years during which they have been enrolled. A revised roster containing only the target students in your district can then be prepared.

Thank you for your interest and cooperation. Your help is vital to me and I appreciate your efforts. If further information would be helpful to you, please do not hesitate to contact me at (916) 342-2567.

Sincerely,

Judy Basta-Brislain

JBB/da
Enclosures

1978 GEOGRAPHIC SAMPLE SUMMARY

County and Site Codes

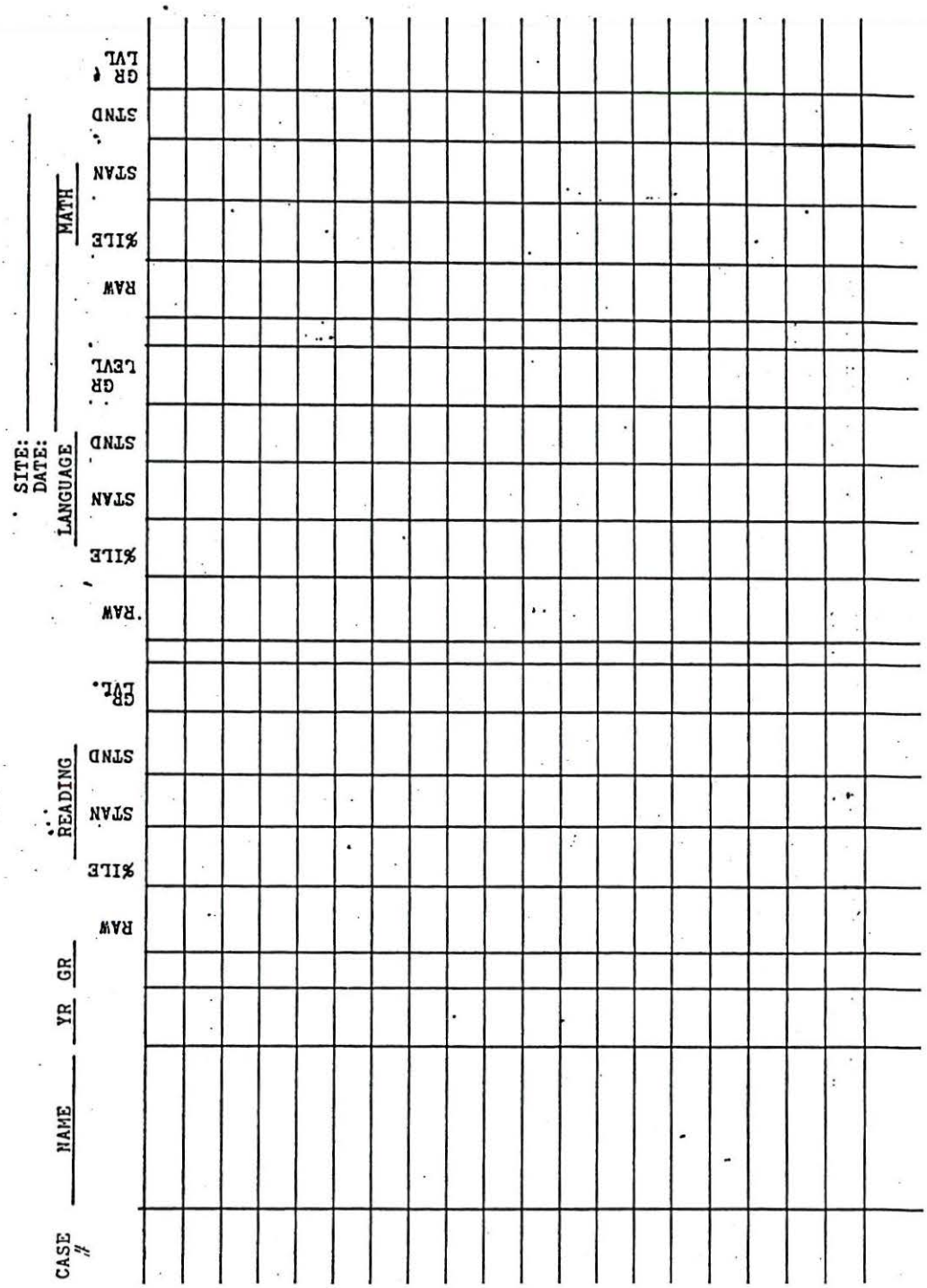
COUNTY/SITE	CODE	SAMPLE #
ALAMEDA COUNTY	A	26 Total
NEWARK UNIFIED	A-1	26
SACRAMENTO COUNTY	B	201 Total
FOLSOM-CORDOVA	B-1	46
NORTH SACRAMENTO	B-2	31
SACRAMENTO CITY UNIFIED	B-3	85
SAN JUAN UNIFIED	B-4	39
SAN JOAQUIN COUNTY	C	173 Total
LODI UNIFIED	C-1	45
MANTECA UNIFIED	C-2	27
STOCKTON UNIFIED	C-3	80
TRACY UNIFIED	C-4	21
STANISLAUS COUNTY	D	45 Total
MODESTO CITY UNIFIED	D-1	

APPENDIX A

1978 SITE SUMMARY

	SITE	COUNTY CODE	SITE CODE #
C	MILANI ELEMENTARY	A-1	01
G	FARMHOUSE PRESCHOOL	B-1	02
C	D. W. BABCOCK ELEMENTARY	B-2	03
C	DOS RIOS ELEMENTARY	B-2	04
G	PLAYMATE PRESCHOOL	B-3	05
G	HAPPY TIME PRESCHOOL	B-3	06
G	BETHANY PRESCHOOL	B-3	07
G	BUSY BEE PRESCHOOL	B-3	08
C	CARMICHAEL PRESCHOOL	B-4	09
C	LICEN ELEMENTARY	B-4	10
C	LINN CHILDREN'S CENTER	C-1	11
C	LODI HEADSTART	C-1	12
C	MANTECA HEADSTART	C-2	13
C	CONWAY CHILDREN'S CENTER	C-3	14
C	STOCKTON CHILDREN'S CENTER	C-3	15
C	TRACY HEADSTART	C-4	16
C	FRANKLIN HEADSTART	D-1	17
C	FRANKLIN CHILDREN'S CENTER	D-1	18
C	MARSHALL ELEMENTARY	D-1	19

APPENDIX B
DATA COLLECTION FORM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